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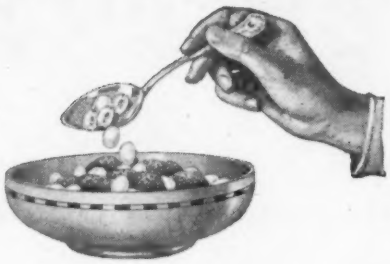

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THE MEDICAL PROFESSION AND SOCIAL PROGRESS.

BY ANDREW F. DOWNING, M.D., CAMBRIDGE, MASS.

LONG before the joy-bells announced to an impatient world that the nineteenth century had given up to Father Time the ghost of an honorable and altogether fruitful life, we had begun to hasten his declining years by paying shameless tribute to the promising youth and vigor of his successor. And now, with two decades of this long-heralded golden age, with which we then flirted, not yet gone, with peace on earth departed, and good will sorely tried, the sad memory of that hurried leave-taking, and still more hurried journey through this young and pampered age, comes to us with vain regret. No longer does the dance go on; no more is joy unconfined; and youth, now mindless of pleasure, for whom there was, and still is, "no sleep till morn," "has a rendezvous with Death at midnight in some flaming town." Satisfied now that what we called speed, and confused with progress, was merely vulgar prodigality, and convinced that only in our determination to secure now, if ever, justice for all, lies the hope of the future, we are making amends to a century that we thought decadent, by seeking the solution of a trying situation in the almost forgotten teachings of Lincoln.

Industrialism, grotesque from abnormal overgrowth, commercialism sunk to the low level of unbearable arrogance, wealth pursued until it blurred the vision, contempt of the toiling, unsuccessful multitudes by the pleasure-seeking, successful few,—were burdens which before the present war began, had grown too heavy for a world that hoped for heaven. In our own country people were money-mad, and upon the answer to the question, "How much money has he?" depended the joy with which a man was welcomed by his fellows, or the indifference with which he was scrapped in the heap of social neglect. Men talking loudly and cynically of our inefficiency and crudeness began to doubt the wisdom that created our Democracy. They held up for our emulation the wonderful efficiency of the German people, the social justice that was theirs, and the unerring judgment and paternal solicitude of the government that made all this possible. Then we enter the world war, in the words of our President, "in armed opposition to an irresponsible Government which has thrown aside all considerations of humanity and of right and is running amuck."

No wonder that we are amazed and ask if this wonderful efficiency *is* really efficiency; if this social justice *is* really justice; if, after all, with its many shortcomings and defects, this old abused and maligned democracy of ours *is* really the failure that our purveyors of pessimism and carriers of calamity would have us believe.

But as individuals we feel a sense of loneliness, a consciousness of some great change that has taken place. What this change is, Graham Wallas in his "Great Society" thus expresses: "During the last hundred years the external

conditions of civilized life have been transformed by a series of inventions which have abolished the old limits to the creation of mechanical force, the carriage of men and goods, and communication by written and spoken words. One effect of this transformation is the general change of social scale. Men find themselves working and thinking and feeling in relation to an environment which both in its world-wide extension and its intimate connection with all sides of human existence is without precedent in the history of the world."

It is a significant fact that Wallas, who in this book prophesied the present war, prefaces his first chapter with an extract from Woodrow Wilson's "New Freedom." "Yesterday and ever since history began, men were related to one another as individuals... To-day the every-day relationships of men are largely with great impersonal concerns, with organizations, not with other individual men. Now this is nothing short of a new social age, a new era of human relationship, a new stage-setting for the drama of life." And when we add to this a few sentences from that great document on human rights which he delivered at the joint session of the two Houses of Congress, April 2, 1917, we shall cease to be amazed and shall begin to understand something about the great change that is taking place in the world.

"We are at the beginning of an age in which it will be insisted that the same standards of conduct and of responsibility for wrong done shall be observed among nations and their governments that are observed among the individual citizens of civilized states." And again: "But the right is more precious than peace, and we shall fight for the things which we have always carried nearest our hearts—for democracy, for the right of those who submit to authority to have a voice in their own governments, for the rights and liberties of small nations, for the universal dominion of right by such a concert of free peoples, as shall bring peace and safety to all nations and make the world itself at last free."

The accomplishment of such an undertaking, tremendous though it be, is not impossible. Slowly but surely, forces in the social and the industrial orders have been preparing the way. Out of what seemed an endless, turbid stream of human misery, the rights of those who toil and suffer are beginning to emerge, and men and women of high purpose are devoting their lives to the cause of social justice that the social world may be redeemed. Politically, democracy is secure only when it has annihilated autocracy, but its victory is not complete until it has triumphed over feudalism, paternalism, and privilege, and has driven them from their industrial strongholds.

So accustomed are we to look upon the social question as the fad of those who strive to make the world a Utopia, that we fail to observe conditions as they are, or, having observed them, accept them as inevitable. The true social reformer, however, sees things as they are and refuses to accept them as inevitable. He recognizes that these sordid conditions are abnormalities that retard the real progress of civilization and make it a mockery to a large proportion of mankind. A dreamer he may be, but only because he has a social imagination and is convinced that we must return to the normal. The word "normalist," as one writer suggests, would describe him more accurately—a normalist seeking the causes that have resulted in the deplorable failure of thousands to attain a decent standard of living. Hence it is that having found the causes, he seeks the remedy that must be applied. Poverty, disease, crime, overcrowding, under-nourishment, overwork, intemperance, lack of education, irregularity of employment or no work at all, monopoly, exploitation of men, women, and children—in short, whatever prevents the individual or groups of individuals from attaining a decent standard of living—are the things that concern him day and night. In the solution of these many problems, the medical profession has played, and will play, no small part.

In the old order, charity, which was no more than alms-giving, had to do with the individual. Too often its influence was degrading, because it was a sorry substitute for justice denied. Another form of charity is thus described by John Boyle O'Reilly:

"Organized charity, scrimped and iced,
In the name of a cautious, statistical Christ."

In the new order, it goes beyond the individual and aims to eradicate those intolerable social conditions that tend to perpetuate disease, pauperism, degeneracy, and crime. It attempts, as Professor Peabody says, "to find a place in modern statesmanship, civic administration, trade, and personal life, for the ideals of humanity, fraternity, and social peace." In the old order, the charity worker considered it his duty to chide the poor, and tell them that their poverty was due to shiftlessness, lack of thrift, and intemperance. In the new order, it is recognized that poverty is not merely lack of money, but appalling and disastrous misery due to a low standard of living, overcrowding, overwork, disease, and friendlessness, for which our present social order is responsible.

It was the old idea that wages were determined only by the law of supply and demand. It is the new idea that the influence of the standard of living cannot be disregarded. It was the old view that the children of the poor should be taught early habits of industry and thrift that they might contribute to the support of the family, even before they had passed the tender period of childhood. It is the new view that children must not be exploited for commercial gain, but that they must be allowed to enjoy their childhood, acquire an education, and bring

to their life-work healthy bodies, and minds trained to the ideals of citizenship. In the old order, education was considered the training in letters of a select few. In the new order, we believe that it is one of the most necessary and permanent interests of all mankind. It was the old idea that those who rose to positions of influence did so only through thrift, honesty, and ability. "Early to bed and early to rise makes a man healthy, wealthy, and wise," says the old adage. Modernized to apply to the toiler of today, the last part might read, "makes a man unhealthy, miserable, and wise"—yes, wise enough, at least, to grasp the new idea that many of the qualities that have enabled the successful to survive will not respond to the acid test of decency. Ignorance, arrogance, trickery, dishonesty, lawlessness, complete ethical paresis, have too often in the past prostituted the rewards of right living and generous service to mankind.

It was the old view that heredity alone determined the social position above which no man could rise. It is the new view that however much heredity furnishes the basis and sets the limits to the development, environment can furnish the stimulus and the opportunity. Heredity determines only what a man *may* become, but environment determines what he *does* become.

In the old order, it was held that men, women, and children, working in the industries, were machines to be speeded up to the highest possible endeavor for long hours in unsanitary factories during the day, for a low wage, and to be recuperated for their next day's work in even more unsanitary houses, during the night. In the new order, it is insisted that workers shall not be pushed beyond the limits of physiological fatigue, but that they shall be given a living wage, healthful surroundings, and decent housing.

It was the old idea that if the employer, usually defended by superior counsel, could prove with the help of witnesses fearful of losing their jobs that he was not responsible for some industrial accident, the maimed workman, or the widow and children, or mother, of him who was killed, must face a still more grinding life of poverty uncompensated. It is the new idea that industry shall bear on its broader and stronger shoulders the burden of accidents, and thereby relieve the injured workman, or the widow and orphans, from the black specter of hopeless poverty. It was the old view that our prisons represented the vengeance of society. It is the new view that they shall not harbor the insane and perverted, or serve as institutions for the graduation of expert criminals. In the old order, sickness was a family affair; in the new order, it is also a concern of the community, to be prevented, if possible, and to be segregated, if dangerous. That is why our hospitals and dispensaries, our nursing and medical care, have been fitted into our social scheme, and that is why large sums of money are being spent to reduce the prevalence of disease by studying those that are not yet conquered. It was the old idea that the case of the backward or incorrigible boy or girl in school was hopeless. It is the new idea that a physical examination, followed by proper treatment, or a change in our methods of education, by supplying manual training, trade, or vocational schools, may save both these children for society.

Now in using as I have the words "old" and "new," I feel that I must apologize for a paradox. What I have called the new is in reality the old. It is as old as the New Testament. It is the Christian view of life. It means faith, hope, charity, justice, love, decency, goodness, friendship, honesty, and generosity. It means the "square deal." It is the view of life that goes with red blood. It is the view of life that gives men "guts."

And the old view is in reality the new view. It is the view of Godless, hopeless, faithless, and dehumanizing philosophy. It is pessimism, modernism, materialism, and immoralism. It is the view that makes men cravens. It is the view of self-ordained supermen, of sycophants, of snobs, and of autocrats. It is the view of arrogant commercialism, heartless industrialism, predatory wealth, and speculative paranoia. It is the view of those who maintain that leisure and wealth are for the few, while the rest of mankind must "grunt and sweat under a weary life." It may be summed up in the teachings of Nietzsche, who raged against Christianity because it recognized the rights of slaves and reminded supermen of their bondage to the moral law. It enabled the weak, the whimpering, and the downtrodden to rise to positions in which he felt that they did not belong, and kept alive masses which ought to be left to die. He argued that sympathy, by preserving what is ripe for destruction, operates to defend the disinherited and condemned among men, and that it is the chief instrument in the advance of decadence. The preaching of sympathy by Jesus of Nazareth was an evidence of his immaturity and youth. "He died too soon," says Nietzsche. "If he had lived to my age he would have renounced his teaching." And this when Nietzsche was thirty-eight!

Moreover, when we turn to consider the functions of government, we are inclined to think that the idea behind the strong demand for progressive legislation is new, radical, and dangerous. Some of our modern progressive measures may be radical, but this is not an argument against the justice and necessity of many measures that occupy the attention of our leaders.

In 1225, ten years after John of England signed the Magna Charta on the historic field of Runnymede, that great teacher St. Thomas Aquinas was born. Although not favoring any particular form of government, St. Thomas held that authority in civil society must have in view the public good, and that if it lose sight of this it becomes unjust, anti-social, and tyrannical.

The aim of the state is not merely economic, but also moral. From this principle, St. Thomas deduces conclusions which are in remarkable accord with modern political theories,—for example, that it is the duty of the state to provide for the education of all its members and to see that no citizen suffers want. It is the fidelity with which the government adheres to the purpose for which it is instituted, that decides the happiness and prosperity of its citizens. Thus we see that what is apparently new in our theory of men's rights, and of the duties and functions of government, can be traced from the Magna Charta through the Declaration of Independence and the Bill of Rights, and through the principles enunciated and upheld by Washington, Jefferson, Lincoln, Theodore Roosevelt, and Woodrow Wilson.

In his progress through civilization to the present complexity of social conditions, man has had to solve many problems and combat many foes. Disease being an unseen foe, and ruthless in its destruction, has been his greatest enemy. Hence the medical profession has arisen. Always on the skirmish line in the march of progress, we may be forgiven, I think, if we assert that without our help man would not have attained his present position; but we must admit that in this march of progress, other doers and other thinkers have been many and indispensable, and we must not be offended, if they, too, with truth, assert that without *their* help *we* would have been unable to succeed. For what we have done, mankind is grateful, and in the past has shown us much respect and has showered us with many favors. To-day, society, none the less grateful, but niggardly in its praise and insistent on its demands, is beginning to look upon, as its own possessions, those great contributions to civilization such as electricity, steam, and the results and achievements of medical science, and demand that they be socialized and made a part of an equitable existence. And it is in this attitude of the social mind, therefore, that we who have been living our selfish lives, without thought of the social struggle going on about us, may seek the causes of several rude awakenings which in the past few years we have experienced. I refer to the Industrial Accident Act and Health Insurance. If the lessons learned from these awakenings have drawn us out of the path of Chauvinism, as I think they have, we shall lose no time in mobilizing our forces, and in developing a solidarity in our ranks that is much needed. We have been too long a profession composed of men who have been satisfied to live the narrow, selfish, and quite unlovely lives of individuals, rather than the broader, more useful, and most attractive lives of social beings. "When the entire moral energy of an individual goes into the cultivation of personal integrity," says Miss Jane Addams, "we all know how unlovely the result may become; the character is upright, of course, but too coated over with the result of his own endeavor to be attractive. In the effort toward a higher morality in our social relations, we must demand that the individual shall be willing to lose the sense of personal achievement, and shall be content to realize his activity only in connection with the activity of the many." Simplified, this may be called the philosophy of "mixing"; the call of the spirit of good fellowship.

The more successful among the members of the medical profession will find more joy of living, by converting the energy which they use in gloating over their successes into real altruistic endeavor not only for society, but for their less fortunate colleagues. Without this high purpose, manifested in such a spirit of *camaraderie* as we have never known, we shall have little to say in any new adjustment of human relations in which we are vitally concerned. In reviewing together some of our past achievements, we may find reason for a closer bond of union, for after all the ties that bind us to what Graham Wallas calls the "Great Society" inspire us with that confidence in one another and those generous feelings which have so often been forgotten or disregarded in the narrower view of life, resulting from the increasing and inevitable demands of specialism in modern medicine.

Two hundred years ago one tenth of our ancestors died of smallpox. In the last decade of the eighteenth century, Edward Jenner, noting the pure complexions and smooth skin of the milkmaids, wondered if the chance infection by cowpox protected them from the dreaded smallpox. Experiment proved him to be right and we had vaccination. Ninety per cent. of the population had smallpox at some time in their lives, and it is a well-known fact that few faces among the royal families were not pock-marked. In the years between 1893 and 1897, this disease was responsible for 275,502 deaths in Russia, while Germany had only 274. Germany has had no epidemic since 1874. The difference represents no vaccination and a compulsory law. When we went to the Philippines, five provinces gave a total death rate of 6000 people yearly; but following a system of compulsory vaccination in 1905 and 1906, there were no deaths from the disease in 1907. In three and one half million vaccinations in the Philippines, there were no deaths and no serious infections. From 1901 to 1905, 500 persons in Philadelphia died of smallpox, but not one of these had been successfully vaccinated within ten years. The epidemic of 1891 and 1892 cost Philadelphia over $21,000,000, while the total cost of vaccinating, disinfecting stations, public instruction, etc., was some $750,000. What are we doing to-day to keep alive the memory of Edward Jenner? What are we doing to see that these facts are taught to our school children as part of the history of civilization? What are we doing to keep this information constantly before the people and our legislative bodies that it may be impos-

sible for those misguided individuals who attack society by opposing vaccination to advance against a machine-gun fire of deadly knowledge?

In 1900 Dr. Walter Reed of the United States Army discovered that yellow fever was given to man through the bite of the female stegomyia mosquito. This mosquito must bite a fever-stricken patient within the first three days of his illness. Thus the yellow fever patient ceased to be a direct source of danger when screened so that no mosquito could reach him. During the nineteenth century the deaths from yellow fever in Havana often numbered 1500 a year; but they stopped abruptly in 1902. Twenty-five per cent. of those attacked by this disease died. When the epidemic of 1878 struck our Southern cities people fled by thousands, and the cost is estimated at $100,000,000—not to mention the loss by death. What are we doing to keep alive the memory of Walter Reed? What are we doing to see that our school children and our people be made as familiar with these facts as they are with less momentous events in history?

The Panama Canal was made possible by the growth of our knowledge of disease. It will be remembered that, besides yellow fever, malaria was also a cause of a high mortality in those southern countries. For instance, the death rate in Havana from malaria before 1901 showed a yearly average of 400, rising in 1898 to 1900 deaths. Since 1901 there has been a gradual decrease until 1912, when there were only four deaths. At Panama in 1906, 821 out of every thousand were admitted to the hospitals for malaria, and in 1913 only 76 per thousand. Of the general situation in Panama Dr. Gorgas says: "We had an average of 900 men sick every day. For the year, this would give us 328,500 days of sickness, and for the ten years 3,285,000 days of sickness. If our rate had been 300 per thousand,—a very moderate figure compared to what it was under the French,—we should have had 11,700 sick every day. For the year this would have given us 4,270,500 days of sickness, and for the ten years 42,705,000, a saving of 39,420,000 days of sickness during this period." This is equal to a savings in cash of $329,420,000.

"During the ten years of construction, we lost by death seventeen out of every thousand of our employees each year. That is, from the whole force of some 30,000 men, 663 died each year, and for the whole construction period we lost 6,630. If the sanitary conditions had remained as they had been previous to 1904, and we had lost as did the French, two hundred of our employees out of each one thousand on the work, we should have lost 7,800 men each year, and 78,000 during the whole construction period." This means that 71,370 lives were saved. The Panama Canal is a monument to many things—the initiative of the American people; the leadership of Theodore Roosevelt; the triumph of modern engineering; the development of steam and electricity; and the dignity of labor. We, however, like to think of it as a monument to preventive medicine, and we hope that sometime the traveler passing through its waters will find here and there a little memorial that will commemorate the work of Jenner, Pasteur, Walter Reed, and others whose work in scientific medicine helped to make possible the accomplishment of this gigantic task.

Typhoid fever formerly caused the death of 30,000 Americans a year. In 1900, the death rate in the United States was 46.5 per 100,000 inhabitants. We have reduced it to 25 per hundred thousand, which is not as low as it should be, considering the European death rate of only 6.5 per hundred thousand. In 1898 in the seventh army corps at Jacksonville, Florida, (10,769 men), there were 4,422 cases of typhoid, with 248 deaths. In the 1912 manoeuvers at San Antonio, Texas, among 12,801 soldiers there was only one case. During the Spanish war there were 20,738 cases of typhoid, with 1480 deaths. Nearly one fifth of the entire army had the disease, and it caused over 86% of the mortality of that war. In the Franco-Prussian war it was responsible for 60% of the mortality among the German troops. Vaccination against typhoid is alread a routine practice in our armies. Before it was introduced, the British garrison in India had a yearly average loss of 500 men from typhoid, but in 1913, less than twenty died. The Russo-Japanese war was the first in history where disease played second rôle to death in battle, and the present world struggle will, we hope, show preventive medicine at her best.

In 1892 Behring, who died almost unnoticed the other day, discovered the anti-toxin of diphtheria. In 1890 its death rate was 66.9 per hundred thousand; 32.7 in 1900; and 19 in 1905. We are fighting cancer, leprosy, and tuberculosis. The sleeping sickness is being conquered. We know more about syphilis than we ever did. Thanks to Dr. Richard P. Strong, we have some control over the bubonic plague, which in the fourteenth century destroyed 25,000,000 people, or more than one fourth of the population of Europe. We are free from Asiatic cholera, which in the year 1885 cost Japan 100,000 lives.

What Pasteur has done for mankind would fill volumes. He who has not read that excellent biography by his son-in-law, Vallery-Radot, lacks a liberal education and has missed some of the joy of living. He was not a doctor of medicine, but a member of that ancient and honorable company of scholars. The son of a simple tanner, he belongs to the people, not to us. Much that we are to-day we owe to him, the father of preventive medicine, the father of bacteriology, the father of life-saving surgery and obstetrics, the conqueror of rabies. Before Pasteur discovered the cause of sepsis, the lying-in hospitals of Paris showed death rates from sepsis of from twelve to twenty per cent. In 1909 the New York lying-in hospital lost only .34 per cent. of 60,000 obstetrical cases, or one out of

1250. The mortality of ovariotomy, formerly 69%, is now 2%; that of compound fractures, formerly 60%, is now 3%; the mortality of major amputations, formerly 50-63%, is now 23%. Lister, who is usually credited as the father of aseptic surgery, gave all the credit to Pasteur. As the years go by, what are we doing to honor and perpetuate the memory of this great Frenchman? No possible argument against vivisection can influence a people familiar with Pasteur's contribution to mankind.

"Not with the dead should he be laid asleep,
Who wageth still with death triumphant strife,
Who sowed the good the centuries shall reap,
And took its terror from the healer's knife."

Here is a rich heritage of historical medicine that may be fitted into our popular scheme of education and utilized to great advantage. That it is being allowed to mould and rot in our libraries in dusty volumes is surely not to our credit. We have health campaigns, it is true,—baby weeks, tuberculosis exhibits, and public lectures, which undoubtedly do some good. But most of these are undertaken not by our society, but by public health boards, and other independent organizations that are interested in the sanitary aspect of the social problem. Working independently of one another, they lack that coordination of effort which is so necessary to ensure success. Too often they enlist the services of amateurs, women and young girls, who look upon the work rather as an adventure than as the undertaking of a serious problem that has an ultimate, definite solution. The people they seek to help often wonder what it is all about, because these facts are presented to them dissociated from their true place in the world's progress. We impress our people with the true historical relation of our old landmarks. Thus it is that Bunker Hill, Lexington, Concord, and the Washington Elm mean something to them. But when we talk of tuberculosis, for instance, we employ archaic methods of education, which tend to frighten rather than educate. We tell them that every time the clock strikes, so many die; and we emphasize the deaths with big figures. Our voices and faces become distressing and melancholy, and monotony is the result. People grow tired of us and seek interests that are more agreeable.

This defect in our system of instructing the people in public health is in fact analogous to the defect in the educational system that trains our workers. "The man in the factory, as well as the man with the hoe," says Miss Jane Addams, "has a grievance beyond being overworked, in that he does not know what it is all about. We may well regret the passing of the time when the variety of work performed in the unspecialized workshop stimulated the intelligence of the workingmen and brought them into contact both with the raw material and the finished product. But the problem of education, as any advanced educator will tell us, is to supply the essentials of experience by a short cut as it were. If the shop constantly tends to make the workman a specialist, then the problem of the educator in regard to him is quite clear: it is to give him what may be an offset from the overspecialization of his daily work, to supply him with general information and to insist that he shall be a cultivated member of society with a consciousness of his industrial and social value." Great social thinkers, therefore, unmoved by the slogan that this is an age of specialization, are making new demands upon our educators and insisting that they realize that the individual in the industrial order needs, as Miss Addams says, "the conception of historic continuity in order to reveal to him the purpose and utility of his work; and he can only be stimulated and dignified as he obtains a conception of his proper relation to society."

This idea ought not to be difficult to grasp, for we are all victims of the same short-sighted system of education. We study medicine and its specialties primarily to make a living, and it seems that the curricula under which we have been trained were arranged with only this idea in view. We have missed the historical aspect and the social relation, not only in our preliminary, but also in our medical, training. Small wonder is it then that we are narrow, and easily roused to anger when a layman dares to express a medical opinion, or when a colleague displays any knowledge of our specialty. We develop a frigidness which we mistake for dignity, and cease to be approachable when a member of our patient's family questions us pointedly about the patient's condition. We criticize the clergyman who thinks he is a "wise fellow" in medicine, forgetting all the time that we do not hesitate to air our views on religion. We gradually grow to that condition of mind which convinces us that our colleagues cannot possibly know medicine, and we like to tell for our own enjoyment "how we put one over on Dr. So-and-so, who missed the diagnosis." When we hear that a certain family is being attended by our colleague down the street, we assume that gracious yet easily interpreted manner of one who says "Are those people crazy?" We are incompatible as individuals, we are incompatible as groups. It is "I am a big man, you are a small man. I have a big income, you have a small one. I am a specialist, you are a general practitioner. I am a real surgeon, you are only a gynaecologist." Bounded by nutshells we think ourselves kings of infinite space.

Retarded by mean and trifling jealousies, imaginary differences, local feuds, and exalted ideas of class distinction, we are rapidly approaching a condition of intellectual stagnation; and unless action is substituted for lethargy, we cannot hope that our position in the "Great Society" will be any better than a maladjustment,

especially for the rank and file—for those of us who, toiling with the toilers, sow much but reap little in worldly reward. Because of our indifference to matters outside of medical practice, our effectiveness as an aggressive social force among the people and before legislative bodies has never materialized We represent potential, not dynamic strength. We are little candles throwing little beams, when we could be one powerful sky-searching light by accommodating the program of our activities to the many problems that bind us to one another as well as to society. The interest awakened recently in the idea of applying rigidly to all our work the test of "end results" is indeed a happy omen. By its direct appeal to the people, who, although indifferent to the mysteries of technic, diagnosis, and experimentation, are alive to results, this idea not only stimulates us to better work, but it also reminds us that the social value and dignity of which Miss Addams speaks, are in our case measured by the quality and not by the quantity of our work. Our end-result campaign, then, expresses a quickened sense of social justice, a desire for a higher social morality.

Social insurance, which in our state and in many others has already more than justified its usefulness, since the passage of the various Workingmen's Compensation Laws, was apparently not "as welcome as flowers that bloom in the Spring," when, in the past year, it paid another visit to Massachusetts in company with two other handmaids, health insurance and old-age pensions. Workingmen's Compensation represents social justice long desired and too long delayed. In 1908 the first act of this kind was passed by Congress at the earnest request of Theodore Roosevelt. It included a small number of Federal employees, and although inadequate in its benefits, it was more than adequate in the moral effect of its example. Up to June 1, 1916, thirty-three of our states and territories had compensation acts on their statute books, but so far, other forms of social insurance have made but little progress. These compensation laws provide for compulsory insurance of employees or for elective insurance, with the alternative of abrogation of the main defenses of the employer under the common-law rules.

Formerly industrial accidents and deaths were the source of incalculable misery. Statistics were unsatisfactory as they were either inaccurate or entirely lacking. In New York and Pennsylvania, the old employers' liability laws were worse than none at all. If an injured man had no legal claim whatever on his employer, he had to rely on his generosity. In the investigation of the facts in the cases of 304 deaths of men who were contributing wholly or in part to the support of families, the following facts were disclosed: Two-thirds of these men were married; 88 of the 304 families received not a dollar of compensation; 93 of the 304 received not more than $100; 62 received more than $100 but not more than $500; 61 received more than $500—most of them less than $1000. That is, 181 families, 59½%, had to bear the entire income loss, and only 61 families, or 20%, received in compensation for the death of a regular income provider more than a sum which would approximate one year's income of the lowest paid of the workers killed. Statistics of this kind might be multiplied. For example, in the report of the New York Commission on Employers' Liability, we find that ten companies, which reported their employers' liability separately, received in three years, $23,523,585 in premiums and paid out in the same time for injuries, only $8,559,795. In a word, much of the financial loss was borne by the workmen—not to mention the resulting misery and distress.

Conditions are better to-day, but there is still much to be done before the employee is satisfied that the present system represents full justice. We may rejoice, however, that a worthy cause has been given a flying start. Therefore when we think of our grievances under this act, let us remember that the workingman has *his*, and that they are more urgent than *ours*. By the introduction of safety devices, better sanitary conditions, and shorter hours of labor, all of which will tend to reduce accidents to a minimum, the idea of workingmen's compensation will bring other and greater blessings; and what is also of importance is that we shall have in the future accurate statistics of industrial accidents, diseases, and deaths, and also financial statistics relating to the business side of this reform. Until we have sufficient data to further analyze this complex problem, we shall have to be content to wait for a more just settlement of the questions that vex our profession. Through our failure to anticipate this legislation by a timely and careful study of social insurance in all its aspects, we are the victims of our own unpreparedness. That workingmen's compensation is now being discussed in our meetings and in our journal is another happy omen, another sign of our quickened sense of social justice.

We are at present engaged in a heated controversy with the supporters of health insurance. What most of us know about it has been learned in a hurry and is still undigested. As an instrument for the amelioration and even the elimination of many present undesirable social conditions, it has in its favor all the arguments that make workingmen's compensation a permanent institution. The difficulty is in the complexities that arise when an attempt is made to fit it into our social scheme. Among the poor, sickness is more frequent and more disastrous in its results than industrial accidents. The poor, and even some who cannot be called poor, find it hard enough to meet the expense of medical service. Our medical schools still send men into general practice and seem anxious to increase the numbers of their stu-

dents. In school we are not told that general practice is to be avoided, but we are sent forth with the idea that ours is a noble profession, honorable in all its callings. Few become specialists; many, not of their own choice but through necessity, seek the harder but sometimes more quickly remunerative work of general practice. The Harvard Graduate School of Medicine is trying to help these men by courses intended to keep them in the front rank of medical progress. This school has even adopted a missionary plan of education by sending men to different cities to spread the truth. What subtle influence is there then inside and outside our profession behind the increasing prejudice against the general practitioner? Why is he so frequently dubbed—and I am now quoting Rubinow—a "Jack-of-all-trades, whose persistence is out of harmony with the recent phenomenal development of scientific medicine"? And he adds, "There is perhaps a distance of a quarter of a century between the present status of medical science and that of medical practice among the poor." These are not new ideas, and we have no contest with Rubinow if he uses for his own purpose statements that have been fed to the public for years, while we as individuals have all selfishly assumed that since we had no over-draft at the bank, these disparaging statements must refer to the other fellow, our neighbor down the street, and not to us. Rubinow has done his part of the work thoroughly and well, as his scholarly treatises on the subject testify. The powerful influences behind health insurance could not have been effective without him. His most difficult task is not to prove the justice of his cause, for that speaks with millions of mouths. The real difficulty is, in slang phrase to "put it across," for never before did any other social welfare measure present so many economic, ethical, social, and political complexities. Fully aware of our weakness, Rubinow had no hesitation, but, like a seasoned campaigner, he quickly mobilized his forces and crossed our boundaries. We lacked leaders; we lacked guns and ammunition; we even lacked shovels with which to dig ourselves in. "It's unconstitutional," we yelled. "It's flagrantly unconstitutional; it's outrageously unconstitutional!" This was the old protesting cry of the trusts against the cruel and abusive treatment of the common people. Think of the poor general practitioner imitating a trust when his income is about to be shot to pieces! "What's the constitution among friends," said Rubinow with a chuckle, as he sat in with his colleagues and proceeded to draft the bill. He probably remembered that when Theodore Roosevelt interfered in the anthracite coal strike early in his administration, he did not create the sentiment which supported him so loyally in his extra-constitutional act. That sentiment was already born, and when Roosevelt declared the common good to be paramount to private right, the Fourteenth Amendment Club, composed of men enjoying the un-American distinction of corporate personality, lay down, like Fido, and didn't even dare to beg. Now in the sentiment that supported Roosevelt against the coal barons, and in the sentiment so persistently and cunningly worked up against the general practitioner, the social insurance extremists thought that they saw an analogy.

But the sentiment that supported Roosevelt was born of love of justice, intensified by bitter hatred of injustice long endured. It was expressed in the unflinching and far-flung challenge by millions of people to the greed of a corporate few. The sentiment against the general practitioner, however, on which the success of this measure largely depended, was born of injustice, hypocrisy, and intrigue. It was expressed only in the incomprehensible and irreclaimable narrowness of a few men, righteous enough in a small way, perhaps, but not agreeable, whose feelings, mildewed by a long, vitiating process of refrigeration, have prevented them from mingling with the crowd spiritually as well as physically, and learning, in the words of De Quincey, "the thoughts, the yearnings, the aspirations, the sympathies, and the repulsions of heart," of those millions of intelligent citizens, who have still to be convinced that the general practitioner is a plague unchecked, and the modern specialist a blessing unalloyed. When this fight began, the medical profession was consanguineous in the first degree with those pacifists, who, Roosevelt says, maintain that world peace is only possible by a disarmament that even goes into the nursery and destroys the toy pistols and the tin soldiers of the children. Happily our disarmament had not been completed and the situation became productive of leadership.

There were other weaknesses in the bill as it was drawn, and since Rubinow was perfectly aware of these facts, I wonder that he did not find some means of making his pet measure less objectionable to the people. The proposed creation of a "twenty-five-dollar-a-week-or-less" social class was an insurmountable difficulty, for it included most of our women school teachers, and thousands of others, who, unable to attain a proper standard of living without constant worry and hardship, are continually fighting for a just stipend. Social insurance must not be a substitute for higher wages. Besides, people resent the idea that they belong to a class which cannot choose their own physicians without paying double freight. We have heard much of Germany's success in social insurance, but I doubt if we shall hear as much in the future. Her efficiency, if it *is* efficiency, *is*, or rather *was*, beyond dispute. But as Mr. William Roscoe Thayer says, "Efficiency is of itself no more praiseworthy than is electricity. The vital consideration is, who applies it and for what purpose. If the object be evil, then the harm done

is greater in proportion to the greater efficiency. The voltage of a lightning bolt which sets fire to a town might supply power to run a dozen factories. Granted that Kultur-made efficiency ranks first, has it been justified by its works?"

It would seem, then, that democracy must avoid a system of efficiency that reduces men to soulless machines. She must learn that the only system of efficiency for her is one that does not lose sight of real human happiness. When autocracies speak, there is no appeal from their edicts, but in democracies, we object to the control of our intimate domestic and social arrangements either by the state or by altruistic corporations of great wealth. It is a settled fact with us that the state is for the people, not the people for the state. And we are proving also in our struggle for progressive legislation, which is in reality a fight for social justice, that neither the corruption of capital, nor the machinations of politics, nor the social myopia of unsophisticated but well-meaning reformers, shall assume that they are above both the state and the people. This does not mean that old Demos is always governed by his intellect and that his decisions always represent a careful consideration of the merits of the question. In democracies, the controlling forces are at all times emotional rather than intellectual, even among those who are highly trained. This is especially true when Demos is opposing Croesus, or the reformer who impresses him, not with meekness, but with that brand of exotic goodness which cannot endure the pollution of his presence.

Thus the emotional tendency of the crowd cannot be disregarded, for if it carries potential harm, it also carries, and in a greater measure, potential good. If the demagogue has won many an unworthy cause by discerning its presence, the reformer has lost many a worthy one by assuming its absence. Its harm is rather negligible and transitory, its good, incalculable and lasting. It is with this psychological fact that the future of health insurance is linked, as are also linked the futures of many other social measures, and even the future of our profession. We appeal to the emotion of the crowd, when we ask them to be loyal to us, and when we tell them that while admitting the need of some form of health insurance, we deny that it can only be secured at the expense of injustice and indignity to them and to us; but we appeal to the intellect, as well as the emotion, of our more fortunate colleagues, when we say to them that unless they establish lines of more cordial and brotherly support with those who are fighting in the trenches of general practice, theirs will be the blame for any maladjustment of the medical profession in our social order. Our fight is their fight. We are their first and only line of defense.

Rubinow will come back. He has retired but is not defeated. We have advanced but have won no victory. Let us forget Rubinow, but remember his lesson of preparedness. Let us forget the old slogan of the trusts, but remember that the people are no longer awed by constitutions. Rather let us bend our efforts toward solving this critical problem, for we have come to the parting of the ways. So far the only constructive suggestion has come from Dr. E. A. Codman, of Boston, and since his plan is economically, ethically, and ideally sound, it deserves our careful consideration. It is based on efficiency (the American idea), on standardization of hospitals, and on end results. It is a reform that begins at the top and goes to the bottom. It calls for medical service that is systematized, humanized, and vitalized. It puts the responsibility for medical progress where it belongs,—on the medical profession,—and it draws a line of cleavage between the physician and the social worker. It eliminates the amateur; it eliminates the unfit. It annihilates privilege, opens the door to opportunity, and socializes our organization. It guarantees a square deal to the poor, and makes possible better treatment for those who are not wealthy. It raises the dignity of our profession, because it commands the respect of the people by recognizing their right to the use of those expensive instruments of diagnosis and treatment in institutions which they directly or indirectly support. In short, it shows us a simple solution of many other allied social questions by readjusting our organization to meet more adequately the needs of all our people.

Such social benefits are impossible under the proposed bill because it is too much tainted with the abstract Utopian idea of improving medical service while deteriorating the medical profession. Health insurance, if it is to be realized, must be an attainable, concrete, living idea that will create a better medical profession—more generous, better trained, better organized, broader visioned, more influenced by a higher social morality, and more productive of real leadership. Otherwise high-grade medical service, like high moral standards, is beyond the compulsion of human legislation.

There are other social problems involving our profession that are soon to demand an answer. Unless we go forth to *meet* them with the aggressive and uncompromising spirit of a militant and elevating social force, sex hygiene, eugenics, and birth control will come to *us*, swaggering with the insolence of popular hysteria and the coarseness of unbridled demagogy. By spreading a knowledge of sex relations and of the vices and evils resulting from sexual indulgence and lack of moral stamina, sex hygiene seeks to emphasize the importance of chastity. The end in view is a noble one, but the ways and means that are being employed to attain this end are open to criticism and rebuke. If merely a knowledge of sex relations and of the dangers of venereal disease would open the gate to chastity, close the door

to prostitution, and send to the shambles gonorrhoea and syphilis, there would be some hope even for those benighted people east of Suez, "where the best is like the worst, where there aren't no Ten Commandments an' a man can raise a thirst." We must admit, however, that west of Suez, where we have, and have had, the Ten Commandments, that neither education, nor wealth, nor position, nor culture, nor marriage, nor the physician's intimate knowledge of these facts, nor prohibition, nor total abstinence has proved impregnable to human frailty, or to the diplococcus or the treponema pallida. And yet may we not say with truth that the Ten Commandments have supplied the most dependable restraint?

Exaggeration, narrowness, hysteria, error, and insult frequently characterize this campaign. It cannot be denied that the discussion of sex with children of tender years may easily arouse cravings that would otherwise remain dormant. There are those extremists who desire to have this subject taught in the pulpit, in the day-schools and Sunday schools, in the factories, and in the press. They say that this conspiracy of silence must be broken; and one lecturer makes the startling discovery that one of the causes of this conspiracy is found in the Hebrew law, which, while enjoining the duty of multiplying, surrounded the only processes by which race continuation is possible with the idea of impurity. After childbirth the mother was considered unclean for a month or more, and was not permitted to touch any hallowed object. "Accordingly, the mother of God was considered unclean for more than a month because she gave birth to Jesus Christ." He pursues this idea as follows: "The Christian church, by referring to the conception of Jesus as 'immaculate' [that is, spotless], emphasizes this point by the unmistakable implication that other conceptions are maculate [that is, attended with fulfilment.]

"The comparatively recent adoption of the dogma of the immaculate conception of the mother of Jesus, by slightly extending the idea of purity in the matter of the propagation of the human species, still further enforces the rule, particularly as the proposition was strenuously opposed in the council which finally adopted it."[2] If the Jew feels that his future in America is bound up with the traditions of his past, is it not an insult to him to speak lightly of those traditions? If the Roman Catholic celebrates the feast of the Immaculate Conception of Mary (which is not a new doctrine any more than the celebration of Lincoln's birthday as a legal holiday would be an evidence of his recent deeds or of anything new discovered in his life), what deformity of the human mind can assume that this supreme expression of respect for motherhood and maiden purity connotes an idea that is antagonistic to a propaganda, the purpose of which is to drive from the face of the earth, if it can do so, the fornicator, the adulterer, and the harlot? We may leave extremes of this kind to a conspiracy, not of simple, but of contemptuous silence.

The whole story of sex hygiene is well summed up by the editor of *Collier's*, that gifted and interesting young Harvard man of the class of 1900, Mr. Mark Sullivan. "It seems clear," he says, "that experience so far shows that the whole problem of sex had better be approached in the spirit of personal reserve that we associate with the better sort of home life, rather than in the spirit of eager curiosity and practical experimentation that we associate with the school. . . . Any system of instruction which gives a knowledge of sex hygiene merely as mechanical knowledge will be a great mistake. Any instructors given this responsibility must have the spiritual force to conquer these problems, and the personality to compel their pupils to reverence. Anything less will be instruction for dogs not for human beings." Are we prepared, in the name of our school children, to protest against the introduction of a system of canine instruction in our schools?

Eugenics, founded on the newer biology and on our increased knowledge of heredity, expresses an interest in some important human problems. It is negative and positive. In its former aspect, which opposes the reproduction of the unfit, it greatly concerns us. If it should become the law in this state, that feeble-minded and other low-grade human beings shall be surgically sterilized, those in the medical profession whose religious belief does not oppose such a measure will have a grave problem to solve. The sterilization of males and females, besides being attended with the usual risks of operation, gives to unprincipled men an opportunity to use our profession as a tool for injustice to others. Wills may easily be broken, and bequests easily diverted to the unworthy, if progeny is thus prevented along a certain family line. Legalized, sterilizing surgery, like legalized abortion, would have a tendency to lower our social morality. In the case of the feeble-minded and other defectives, negative eugenics has the sanction of biology, but like many other social reforms, the problem to be solved is so complex, economically, morally, and religiously, that we must not assume too readily that the segregation of those unfit to reproduce will not in the end be less burdensome to society than surgical sterilization. The eunuch was a creature of an obsolete civilization; let us not make our civilization obsolete by his presence. The Great Wall of China was built by the labor of 600,000 prisoners, surgically reduced to the condition of oxen. The experiment has never been repeated. Let us beware lest our enthusiasm for attractive social measures lead us into the temptation of substituting a heavier burden of social misery for one that is at least bearable.

Birth control, the most clamorous of all these questions, has for its ultimate aim, so its supporters say, the better and greater development of the individual. Malthus's remedy, over a hundred years ago, was to discourage marriage among those who could not afford it, or else to throw into the sty of human misery the families of such unions. "These are the unhappy persons," he says, "who in the lottery of life have drawn a blank." He did not recommend contraceptive measures or abortion to keep down the birth-rate, but depended rather on the acts of abstinence and self-control. The modern Malthusians, however, of whom Havelock Ellis is the high priest, recommend contraceptive measures, and do not seem to express any pronounced disapproval of abortion. In a popular magazine,[2] several years ago, Ellis declared that "women have an abstract right to abortion, and that, in exceptional cases, this right should be exerted, even though it is an injurious, wasteful, and almost [note the "almost"] degrading method of dealing with the birth-rate." There has appeared in this country a newer school of birth-control, the purpose of which is to give information and distribute literature on contraceptive methods by repealing in the first place the laws that at present stand in their way. Their slogan seems to be "Everybody's doing it." Hence they desire to help the poor, and others who may wish to limit the number of their offspring.

A writer of this American school[4] has determined to devote his feeble pen and leisure time to these things: "First, to advocate the propriety of preventing conception, of limiting the number of one's children according to one's economic means and other circumstances; second, to a study of the best, safest, and most harmless means of preventing conception; and third, to a dissemination of this knowledge among the medical profession, and through it, among the laity." The pen that can do this is not feeble, but mighty and dangerous. These dangers are apparent even to a feeble imagination. This same writer chafes at the idea of religious people "forcing their morals and their conduct upon people who are guided by different standards of morality.... Religion is a matter of faith and not reason; you believe so-and-so and that is all there is to it." Now the social question and religion are not rivals. Blind indeed is that reformer who does not see that religion can play and must play a momentous part in this irrepressible social conflict. Social questions are not altogether economic facts, but they also present moral, ideal, and religious aspects, which cannot be ignored. Even the industrial world, big, powerful, and at times pitiless, which would seem to be dominated only by the bloodless rule of economics, is a moral fact, inasmuch as it rests on credit, and depends for its existence on the confidence which the people have in its integrity. And if the industrial world is a moral fact, much more so is the family, which is the basis of our whole social structure. In it are developed those social virtues of loyalty and generosity; in it we see the kindergarten of the moral education of the race.

"The family, many people may be almost surprised to learn," says Professor Peabody, "is not a device invented to procure either personal happiness or mutual convenience. The family is, on the contrary, the world's first and greatest venture in altruism. . . . The family is in danger when it is created for what one can get out of it; and it is safe only when it is prized for what one can give to it. . . The most important step in the education of the human race is taken, when out of the surviving instincts of animalism and commercialism there emerges, in a man or woman, the ideal of a humanized love, dedicated to the creation of a family, and finding in that union, not limitation but enlargement, not sacrifice but joy." To assume, then, that neither religion nor morality has any grounds for opposing birth-control is to express a practical materialism, cynical, pessimistic, and brutal, which jeopardizes the entire social question. "How feeble a conception must that man have of the infinity which lurks in a human spirit," says De Quincey, "who can persuade himself that its total capacities of life are exhaustible by the few gross acts incident to social relations or open to human valuation!" Social changes sought by changes in economic methods bear the cruel imprint of the cloven hoof when they seek to overthrow the world of the human heart.

In our social order, men of religion are second to none in dignity and worth, because in their teachings are found the essentials of the highest type of good citizenship. Herein lie the strength and the hope of democracy. In their philosophy are more things than many a social reformer or economist has ever dreamed of. In their code of morality, standards are termed high or low. They are not concerned with "different" standards, and moreover they do not feel, when they are protecting their flocks, that they are forcing their own morals and conduct upon those reformers whose code of morality is, in their judgment, a menace to society. They do not believe that religion is altogether a matter of faith and not of reason. They teach that where reason ends, faith begins, and that faith does not contradict reason, but strengthens and supplements it. A man's acceptance of, and adherence to, a religious belief is very clearly a fact in the domain of reason and not of faith. "On the question of immortality," says Osler, "the only enduring enlightenment is through faith." "Life is for action," says Cardinal Newman. "If we insist on proofs for everything, we shall never come to action: to act you must assume, and that assumption is faith." In a human sense, faith, that is, con-

fidence, makes possible the existence of our complicated financial system. Hence we see that faith is not altogether divorced from reason. Religion is a hard task-master, a good disciplinarian. "The fundamental need of democracy is discipline," says Mr. William Roscoe Thayer, "and that is all the more difficult to organize and apply in a society based on the cardinal principles that each of its members shall be hampered as little as possible by the state in his personal freedom." "Religion makes the march of progress possible, and the struggle of life less severe," says the Reverend Edward Cummings. "But for it the rank and file of those who toil and suffer would be driven in desperation to join a socialistic mutiny." By taking a broader view of the social question, the birth-control enthusiast will be able to visualize the dangers, as well as the safeguards, of our Democracy, which is now undergoing the most distressing trial in her history. But he must first get over the idea that the religious teacher is merely a sky-pilot, in an old Wright model, endeavoring to break the altitude record in a fool's attempt to establish a wireless connection with the supernatural.

As a matter of fact, there is no other social question in which there is such a confusion of cause and effect. Civilization is not destroying itself, and "everybody is *not* doing it." Programs of social reform based on such unwarranted assumptions will only undo the good already accomplished by those whose moral maturity has kept their course true between the Scylla of sentimentalism and the Charybdis of pessimism. Social misery is not the result of big families, but rather an unnecessary and indefensible condition caused by a disregard of those finer feelings that spring from what the world sneers at as sentiment, but which in reality denote the true religious spirit. What the world most needs is more, and not less, evidence of this spirit among those whose decisions determine the happiness or the heart-aches of the people. "If the Christian character is to have any place in modern life,"—if I may quote Dr. Peabody again,—"it must be precisely where these men are, in the heat of the world's work and under the load of the world's care; and the worst of disasters, alike for religion and for business, is to separate the one from the other."

The subject of social progress, even as it relates to us, is too appallingly big to pursue further within the limits of this paper. It travels many roads, crosses many fields, and conflicts with many interests. Have we as individuals reached a condition of intellectual stagnation which makes it impossible for us to be responsive to the vital needs of our complex social order? Or have we as an organization become so deaf to the crying distress of the people that we are satisfied to remain more interested in adhering to traditional programs than in going forth to meet new issues? Into the midst of much heated discussion, I have tried to project a point of view which will not vanish when subjected to the ripened judgment of experience. Firmly believing that the future of our profession in this new social age, depends on our devotion to the highest ideals of life, I submit this essay to the enlightened criticism of my colleagues, with the hope that it may in some little way serve to show us our duty in the great task of social regeneration which will "make the world itself at last free."

NOTE: I wish to acknowledge my indebtedness to many books. I would especially mention that excellent little book, which is a veritable gold mine of information, The Physical Basis of Society, by Prof. Carl Kelsey of the University of Pennsylvania. D. Appleton & Co., New York, 1916.

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STUDIES OF INFANT FEEDING.

VIII.

THE MINERAL CONSTITUENTS (ASH) OF MILK.*

BY A. W. BOSWORTH, BOSTON,

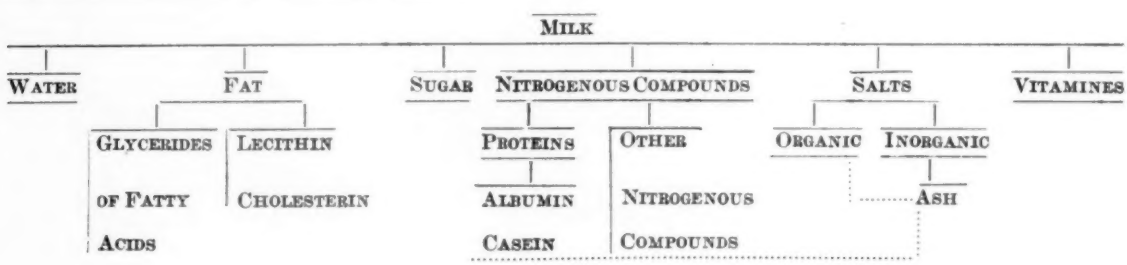
AND

H. I. BOWDITCH, M.D., BOSTON.

[From The Boston Floating Hospital Laboratories.]

MILK is often spoken of as a food containing all substances required for growth. This may be represented diagrammatically as follows:

* Read before the New England Pediatric Society on March 30, 1917.



Chemically, milk may be considered as water carrying a mixture of food substances, these substances being present in the water, in true solution, in colloidal solution, in suspension, and in the form of an emulsion. The conditions in which the different components of milk are carried in the water are shown in the following table:

1. Milk constituents in true solution in milk serum.	2. Milk constituents partly in solution and partly in suspension or colloidal solution.	3. Milk constituents entirely in suspension or colloidal solution.
(*a*) Sugar	(*a*) Albumin	(*a*) Fat
(*b*) Citric acid	(*b*) Inorganic phosphate	(*b*) Casein
(*c*) Potassium		
(*d*) Sodium	(*c*) Calcium	
(*e*) Chlorine	(*d*) Magnesium	

The composition of milk will vary with the species and with individuals of the same species. The average compositions of the two milks with which we are concerned are as follows:

COMPOSITION OF COW'S MILK AND HUMAN MILK

	Cow's Milk Per Cent.	Human Milk Per Cent.
Fat	3.90	3.30
Milk-sugar	4.90	6.50
Proteins (combined with calcium)	3.20	1.50
Salts	0.90	0.31

If the differences shown in this table were the only ones confronting us in the problem of properly modifying cow's milk for infant feeding, many of the formulae now in use should serve the purpose very well, for it is very easy to modify cow's milk in such a manner as to give a mixture which will contain the amounts of fat, sugar, proteins and ash found in human milk. There are other differences, more deep-seated and obscure, however, comprehensive consideration of which may be far-reaching in practical application, when they are more fully understood.

Breast milk is nature's food for the infant, and we may consider the constituents to be so balanced as to meet all the demands of growth, with a minimum of waste. Cow's milk, on the other hand, is nature's food for the offspring of the cow, and is not balanced in any respects as a food for infants, and its use as such must usually be preceded by some form of modifying which will make the quantitative relations between the fat, sugar, protein and water approximately that found in breast milk. In most, if not all, of these methods for modifying cow's milk, the mineral elements present receive very little consideration, being passed over with the statement that modified cow's milk will always contain a larger percentage of ash than breast milk, and hence will furnish all the mineral elements necessary. The time has come, however, when this phase of the feeding problem can no longer be treated in this manner, and those concerned must realize that more care must be taken to see that the mineral elements are properly balanced. This adjustment must take into consideration not only the mineral elements themselves, but also their relations to the organic constituents of the food, for it is well known that certain of the mineral elements may interfere with the proper utilization of the organic components. This is especially true with respect to calcium and fat.

It is known that bottle-fed infants absorb and retain a much smaller percentage of the mineral elements ingested than is the case with breast-fed infants, and this has been considered as due to the fact that bottle-fed infants receive an excess of mineral elements, and necessarily must excrete greater amounts. While this is in part true, we wish to emphasize the fact that in using cow's milk for infant feeding, the larger excretion of mineral elements is, for the most part, due to the fact that these elements, as they are present in cow's milk, are not completely available as food for infants. It will be seen, therefore, that the consideration of the forms in which the mineral elements are present is the important fact, and not the mere presence of these elements, for the presence of a certain amount of an element does not necessarily mean that the whole amount is available as a food for infants—a fact which has been demonstrated by investigations now under way in this laboratory.

It has been shown by one of us that, while di-calcium phosphate ($CaHPO_4$) is a normal constituent of cow's milk, it is not a constituent of human milk. As this salt has always been found by us in large quantities in the feces of infants fed upon cow's milk, and to be absent or present in very small amounts in the feces from breast-fed infants, we have investigated the question of the availability, as a food for infants, of the di-calcium phosphate present in cow's milk. We have fed a synthetic milk to infants, the only inorganic salt present in this food being di-calcium phosphate, and have recovered in the feces from 64 to 100% of the salt fed, the smaller recovery being from infants eight or nine months old, and the complete recovery from infants one to four months' old.

We have also shown that under ordinary conditions any excess of soluble calcium received in the food is precipitated in the intestines as calcium carbonate or insoluble calcium soaps, and is not available as a food, and that the addition of limewater to milk, although increasing the actual calcium content of the milk, really brings about a precipitation of insoluble calcium phosphate, leaving amounts of soluble and available calcium and phosphorus which are less than those to be found in breast milk. A child receiving modified milk to which limewater has been added may be receiving insufficient amounts of available calcium and phosphorus—a fact which should receive more attention in connection with the feeding of certain children, *i.e.*, rickets, spasmophilia, etc.

In connection with the use of cow's milk in infant feeding, it has been the general practice to consider the quantity of mineral elements present in this milk to be represented by the ash. This ash, amounting to about 0.7%, has usually been thought to contain all the mineral elements in the milk, and the figures obtained by analysis of such an ash have been quite generally accepted. Such an analysis does not, however, represent the true mineral content of milk, for under conditions ordinarily surrounding the determination of ash some of the sulphur and phosphorus in the casein molecule will be lost by volatilization. If this loss is taken into consideration, the true mineral content of cow's milk of average composition will be found to amount to 0.8% of the milk.

This point was brought out by the examination of several samples of milk, the figures in Table I being representative of data obtained from milks of average composition.

TABLE I. MINERAL ELEMENTS IN MILK AND MILK ASH.

	Cow's Milk		Human Milk	
	In Ash From 100 c.c. Milk	In 100 c.c. Milk	In Ash From 100 c.c. Milk	In 100 c.c. Milk
	Gm.	Gm.	Gm.	Gm.
SO_3	0.025	0.054	0.002	0.004
P_2O_5	0.199	0.249	0.034	0.036
Cl	0.076	0.076	0.038	0.038
CaO	0.201	0.201	0.050	0.050
MgO	0.022	0.022	0.005	0.005
K_2O	0.145	0.145	0.086	0.086
Na_2O	0.074	0.074	0.020	0.020
	0.742	0.821	0.235	0.239
Oxygen equivalent to chlorine	0.017	0.017	0.008	0.008
TOTALS	0.725	0.804	0.227	0.231

A cow's milk giving an ash amounting to 0.725% will be seen really to contain miner elements to the extent of 0.804%, while human milk giving an ash amounting to 0.227% will be seen to contain mineral elements to the extent of 0.231%.

The incineration of milk leaves an ash in which the arrangement of the elements is altogether different from that in which they were present in the original milk. This is due to the fact that some of these elements are in part combined either with or within organic molecules.—part of the phosphorus being combined within the casein; all the sulphur being combined within the albumin and casein; some of the calcium being combined with the proteins; and part of the other bases being combined with citric acid to form citrates; and upon ashing these organic molecules are destroyed, the mineral elements involved being converted to oxides, and in the cases of the sulphur and phosphorus some may be lost by volatilization. The following statement of the forms in which the mineral elements are to be considered as being present in milk is given, as the result of extended studies of the chemistry of milk.

TABLE II. FORMS IN WHICH THE MINERAL ELEMENTS ARE PRESENT IN MILK.

Organic Combinations	In 100 c.c. Cow's Milk	In 100 c.c. Human Milk
	Gm.	Gm.
Sulphur within the casein and albumin	0.022	0.001
Phosphorus within the casein	0.022	0.001
Salt Combinations		
Calcium combined with the protein	0.054	0.024
Di-calcium phosphate, $CaHPO_4$	0.175	0.000
Mono-magnesium phosphate, $MgH_4P_2O_8$	0.103	0.027
Di-potassium phosphate, K_2HPO_4	0.230	0.000
Mono-potassium phosphate, KH_2PO_4	0.000	0.069
Potassium citrate, $C_6H_5O_7K_3$	0.052	0.103
Sodium citrate, $C_6H_5O_7Na_3$	0.222	0.055
Calcium chloride, $CaCl_2$	0.119	0.059
Iron	Trace	Trace
TOTAL SALTS	0.955	0.337

TABLE III. COMPARISON OF PERCENTAGES OF ASH, MINERAL ELEMENTS AND SALTS IN MILKS.

	Cow's Milk	Human Milk
Ash	0.725	0.227
Mineral elements as oxides and chlorides	0.804	0.231
Salts (including the calcium of casinate	0.955	0.337

If we compare the totals given in Tables I and II we notice that the salt content of milk is considerably larger than the mineral or ash content. This is due to the citric acid of the milk appearing as citrates in the enumeration of the salts, while in the enumeration of the minerals these citrates appear as oxides of bases. In this connection it may be of interest to state that the sum of the fat, the sugar, the proteins and the ash never equals the total solids, for milk contains other substances which are not included in the determination of either the fat, the sugar, or the proteins, and are lost when the milk is ashed. The determination of any of these constituents by difference, therefore, throws an error of from 0.2% to 0.3% upon such determination. A milk containing 4.5% of sugar would show 4.7 to 4.8% if the sugar was determined by difference.

In view of what has been said in this paper, it may be of interest to know that the beneficial results obtained by the feeding of the Eiweissmilch or protein milk of Finkelstein is, without doubt, due to the fact that the available mineral content of this milk approximates very closely both the amount and form found in breast milk, for, notwithstanding the high ash content of protein milk (0.65%) half of this ash is present in the milk as insoluble calcium phosphate, a substance which is inert in so far as the metabolism of the infant is concerned.

DISCUSSION.

DR. HILL: I have followed Mr. Bosworth's work closely in the last year or two at the Children's Hospital, and I must say that I think he is absolutely on the right track in everything that he is

doing. More difficult "feeding cases" are due to a chronic impairment of fat absorption than to any other cause, and this is brought about by the combination of the calcium of the cow's milk with the free volatile fatty acids present, forming insoluble calcium soaps, which cannot be absorbed, thus causing a great loss of calcium and of fat in the stools. A great many cases of rickets are undoubtedly caused in this way, and I believe that when we have more light on the chemical processes that bring about this difficulty of fat absorption, we shall be able to deal with our cases of malnutrition much more intelligently than we do now. At present it is true that we get good results in many of our cases of chronic fat indigestion, by simply cutting down the fat in the diet, and perhaps raising the other food elements to make up the calories. This, however, is begging the question; what we should be able to do is to feed such a milk to our babies that insoluble calcium soap formation will not go on, and this is the goal toward which all Mr. Bosworth's work points.

MR. BOSWORTH: In connection with what Dr. Hill has just said, it may be of interest to you to know that the soap in infants' stools is calcium soap of palmitic acid, calcium palmitate being very insoluble. If you take the calcium out of the food of a child showing an intolerance for fat with a high content of soap in the stool, the soaps disappear entirely. A child giving off 15 grammes of soap in twenty-four hours will give off about 3/10 gramme of soap in the next twenty-four hours if the calcium is removed from the food.

DR. LADD: I would like to ask if there are any soluble calcium soaps?

MR. BOSWORTH: The soaps of the lower fatty acids are soluble, and there is a degree of solubility, of course. Palmitic acid is the most insoluble of the fatty acids in cow's milk. This is due to the fact that the melting-point is high. The solubility and the melting-point are hitched up together in some way. The melting-point of palmitic acid is 62° C., quite a bit above body heat.

BASIC PRINCIPLES IN THE SYMPTOMATOLOGY OF BRIGHT'S DISEASE.

BY H. ELWYN, M.D., NEW YORK CITY.

IN reading current literature on Bright's disease we are confronted with the description of a multiplicity of types. There is the hypertensive type and the non-hypertensive type, the nitrogen-retention type, the sodium-chloride-retention type, etc. All these descriptions have this fundamentally wrong with them,—that they attach too much importance to a single symptom, without emphasizing the uniform principle practically underlying all cases of Bright's disease.

In studying diffuse kidney diseases there are the three elements of the kidney which we have to consider, namely: tubules, glomeruli and vessels of the kidney. Volhard and Fahr, in their remarkable monograph on Bright's disease, have well demonstrated that each of these elements, when diseased, will produce a characteristic symptom-complex, and that we can well infer, from the symptoms presented, the exact histological picture of the diseased kidney; and this without the aid of dye tests, mathematical formulae and other cumbersome procedures.

As prolegomenon to correct understanding, we have to consider what is the essential function of the kidneys; what is meant by a sufficient kidney and by an insufficient kidney; what elements are involved in kidney insufficiency; what is the compensatory mechanism, and finally what is the ultimate result of kidney insufficiency.

The function of the kidney is to excrete the waste products of metabolism. Of the various waste products, the non-protein nitrogenous substances, chiefly urea, form the most important elements. The necessity of their excretion is a matter of life or death. Inability to excrete them invariably leads to death in a short time, after a certain amount has accumulated in the body tissues. Not so with the mineral salts. Retention of sodium chloride may last for months; it favors edema, water retention and cardiac insufficiency, but is never the immediate cause of death.

We may consider, then, as the *essential function* of the kidney, the elimination from the body of the nitrogenous substances in the form of the non-protein nitrogen, and, indirectly, the maintenance of a normal level of the so-called rest nitrogen in the blood. This level, Folin and his co-workers have definitely proven to be, in normal health, 23 to 27 mgm. per 100 cc. of blood. The excretion of these products is effected in a solution, which the kidney can either concentrate to a high degree, so as to save fluids for the body, or eliminate in a very low dilution with a sufficient quantity of fluid intake. We can measure this ability of the kidney to concentrate by the specific gravity of the urine, which reaches, with a normal kidney, to above 1040. This ability to concentrate or dilute, according to needs, we call the *variability of kidney functions*, and it forms the essential means of the proper functioning of every normal kidney.

By a sufficient kidney, we mean a kidney that is able to eliminate the essential waste products under a variety of conditions with a variability of function. And we mean by an insufficient kidney one which loses this variability of function, and must either use a compensatory mechanism to help eliminate the waste products, or else fail to do so, entirely.

Variability of kidney function is dependent entirely upon the integrity of a sufficient number of glomeruli, and reduction of the functional capacity of the glomeruli to a sufficient degree, by inflammation or chronic obliteration, will result in a gradually increasing loss of this

variability of function. The result is a urine of low dilution, and in order to excrete all the waste products, the kidney must excrete continuously of this greatly diluted urine. But water excretion is dependent on glomerular function, and with the reduction of glomerular function, water excretion is impaired. The only thing that the kidney can do is to force enough water through those glomeruli that are still functionally capable, and it does this by raising the pressure in the glomeruli and, of course, in the whole arterial system.

The compensatory mechanism, then, consists in hypertension and increased diuresis of a hyposthenuric urine. Obliteration of the glomeruli to a point where, with hypertension and increased diuresis, the kidney fails to eliminate all nitrogenous waste substances, will result in an increase of the rest nitrogen level in the blood, progressive to a degree where death results. The same will result when the blood pressure falls, for any reason, to a degree where the compensatory mechanism breaks down.

By taking the specific gravity of the urine over a prolonged period of time, we can well establish the variability of which the kidney is capable. By giving the patient an additional water intake, we can see how promptly it is excreted, and by placing him on an absolutely dry diet, how high he can raise the specific gravity of the urine. Increased amount of rest nitrogen in the blood always means manifest kidney insufficiency, capable of returning to normal when the glomeruli are acutely inflamed, but always progressive where the glomeruli are permanently obliterated.

With these considerations let us review the various forms of diffuse kidney disease.

In acute diffuse glomerulo-nephritis we have a condition in which all the glomeruli are hit. The causal agent is always bacterial in origin, with the streptococcus in the lead. Although all the glomeruli are involved, they are not equally so, and side by side with bloodless, swollen glomeruli, with proliferation of cellular elements, there are glomeruli whose capillaries still contain blood and are, in a measure, functionally capable. Applying our tests for kidney insufficiency, we find that variability of function is diminished in proportion as the glomeruli are affected, and that retention of non-protein nitrogen in the blood is in inverse proportion to the ability of the compensatory mechanism to maintain diuresis through the less affected glomeruli.

As an expression of acute inflammation there is hematuria. This in diffuse kidney lesions is always a symptom of acute glomerular involvement. With the blood in the urine there is always slight albuminuria and cylindruria. Cases of acute diffuse glomerulo-nephritis are hardly ever pure, and nearly always there is a secondary tubular degeneration which expresses itself, clinically, by generalized edema, cavity hydrops of a pseudochylous transudate, marked albuminuria and cylindruria.

The clinical picture of acute diffuse glomerulo-nephritis, as we see it, is, therefore: a hemorrhagic urine with some albuminuria and cylindruria; an increase in blood pressure as an attempt of the compensatory mechanism to maintain normal diuresis. If the inflammation is very slight and there is sufficient glomerular functional power to maintain the essential function of the kidneys, there will be no rest nitrogen retention in the blood, and practically the only symptoms presented, besides the urinary findings, will be a concentration ability of probably not above 1025, and an increase in blood pressure of perhaps 20 to 30 mm. of mercury above the normal. This, also, is often the picture in an inflammation which is beginning to recede.

With a severe inflammation, concentration ability hardly rises above 1018 to 1020, and although the compensatory mechanism of hypertension may result in a systolic blood pressure of 180 to 200 mm. of mercury, there is still so great a loss of glomerular functional power, that the essential function of the kidney cannot be maintained, with the result that the rest nitrogen level in the blood is increased and may exceed 80 and 100 mgm. per 100 cc. of blood.

In most of these cases of acute diffuse glomerulo-nephritis *restitutio ad integrum* is possible. The indication for treatment is: rest in bed till all signs have disappeared, a minimal protein intake, and a salt-free diet if edema is present. A gradual fall in blood pressure and of the rest nitrogen level in the blood, an increased concentration ability, together with the disappearance of blood from the urine, are the signs of betterment. Usually the blood pressure is last to return to normal, and in this connection a knowledge of the individual is important. In an individual who before the attack of acute nephritis has been carrying a blood pressure of 150, we should not expect to have it return to a lower level with the subsidence of the acute attack.

There is really nothing in kidney pathology that one can confuse with this picture. For in cases of focal nephritis or of the embolic glomerulo-nephritis of streptococcus viridans endocarditis, where the hematuria indicates acute glomerular lesions, although conceivable, there is practically never any kidney insufficiency, and therefore no loss of functional variability, no increase in blood pressure, no increased rest nitrogen in the blood.

If the kidney does not recover completely it passes into a chronic diffuse glomerulo-nephritis, in which functional activity is dependent either upon the glomeruli which have recovered completely or upon those which, having undergone chronic inflammatory changes, are still capable of functional activity. Loss of variability of function is a manifest symptom of kidney rest diuresis. The kidney remains sufficient and a

normal level of rest nitrogen in the blood is maintained as long as a sufficient quantity of urine of low dilution can be excreted by this kidney rest with the aid of the compensatory mechanism of hypertension. As long as the kidney is able to do this we may call this the latent stage of chronic diffuse glomerulo-nephritis, to distinguish it from the last stage when the kidney is manifestly insufficient.

We have, then, as the clinical picture of the latent stage of chronic diffuse glomerulo-nephritis: hypertension of 200 to 250 mm. of mercury; polyuria; a concentration ability of about 1020 on a dry diet; a slow elimination of an increased water intake; excretion of all of an extra sodium chloride intake, but over a prolonged period of time and in a urine of low dilution; a trace of albumen in the urine and a normal level of rest nitrogen in the blood.

There is only one other clinical picture for which this stage of nephritis can be mistaken, namely: arteriosclerosis of the kidney, in which the finer and often the finest vessels are involved. The condition is known under various names, as the granular kidney, benign hypertension, simple kidney sclerosis (Volhard and Fahr). It presents, clinically, hypertension reaching 200 mm. of mercury and above, polyuria, nycturia, with traces of albumen in the urine. But in this condition there is no loss of variability of function, ability to concentrate is retained and is very high on a dry diet. An increased water intake is promptly eliminated. The polyuria and nycturia are dependent not upon a kidney rest diuresis, but upon a latent edema due to the relative insufficiency of a hypertrophied heart muscle, which again is the result of prolonged hypertension. This can be well shown by placing the patient on a salt-free diet with a limited water intake and also with absolute rest in bed. The polyuria and nycturia will rapidly diminish and often disappear entirely. In this condition the glomeruli are not diesased at all, the primary condition is that of hypertension, dependent upon changes in the finer vessels of the kidney.

The kidney in the latest stage of chronic diffuse glomerulo-nephritis is prone to acute exacerbations, resulting in a fresh hematuria, diminished diuresis and rest nitrogen retention in the blood. A careful anamnesis and close observation will often establish the latent chronic nephritis previous to the acute exacerbation. Again, we must not consider every case of acute symptoms in an elderly individual with high blood pressure as an acute lighting up of a previous chronic nephritis. This is very important with a view to prognosis.

The latent stage of chronic glomerulo-nephritis may last only a few months, or it may be prolonged over a period of many years. Its course is always progressive, and the clinical cases present a variety of transition forms tending towards the stage of manifest kidney insufficiency. Occasionally we meet with borderline cases, between the latent and the manifest, especially in individuals who have suffered from gout or have been lead workers, in which the rest nitrogen is often 50 to 60 mgm. per 100 cc. of blood. In such borderline cases a non-protein diet will restore nitrogen level in the blood, and prove that the kidney rest is still capable to maintain the essential function of the kidney, if not subjected to too much strain.

As the chronic glomerulo-nephritis progresses towards its terminal stage, we have manifest kidney insufficiency. As the kidney rest is reduced and its functional capacity diminished more and more, we have practically a total loss of functional variability. Concentration of urine remains fixed at 1006 to 1014. The compensatory mechanism of increased diuresis, although continuously at work night and day, is unable to eliminate the nitrogenous waste products of metabolism, at a minimal non-protein food intake or even at a total absence of protein in the food. The result is a gradually increasing level of rest nitrogen in the blood to a degree where symptoms of poisoning are produced, the figures before death often reaching 300 mgm. per 100 cc. of blood.

Blood pressure is excessively high, often reaching 275 to 300 mm. of mercury. Insufficiency of the hypertrophied heart muscle will complicate the clinical picture. There may be a fall in blood pressure and with the breaking down of the compensatory mechanism of hypertension the quantity of urine will be diminished, and with the increase of rest nitrogen in the blood death will quickly follow.

With the gradual increase of rest nitrogen in the blood there is added the picture of true uremia, that is, of retention of the constituents of the urine in the blood, of the grand azotemia of Widal. The symptoms of true uremia are remarkably uniform. Beginning with anorexia, dyspeptic phenomena of vomiting, thirst and diarrhoea, there is a gradually increasing weakness and feeling of fatigue, apathy passing into drowsiness and stupor. This is accompanied by a characteristic restlessness and increased irritability of the muscles of the extremities, but never developing into convulsions. There is subsultus tendinum. Stupor finally passes into coma in which the pupils are contracted, the reflexes are increased, but there is no Babinski. Respiration is deep and slow, characteristic of states of acidosis. Pericarditis is often present the last few days.

Albuminuric retinitis is as a rule present in most cases in the terminal stage of chronic nephritis. It is often an early sign when the insufficiency of the kidney is still slight. It is never a sign of acute glomerulo-nephritis nor of the second latent stage of chronic glomerulo-nephritis but always a symptom of beginning manifest kidney insufficiency.

In tracing the sufficiency or insufficiency of a kidney through the various stages of glomerular

injury, there is one complication of acute glomerulo-nephritis which we have to consider, namely: eclamptic convulsions. Convulsions do not belong to the picture of pure nephritis in any of its stages, and they practically never occur in the second latent stage or in the third terminal stage, but they are always a complication of the acute stage or of an acute exacerbation in the chronic stage. Acute diffuse glomerulo-nephritis may run without this complication throughout the entire course or may develop convulsions at any time. We do not know the causal mechanism, and the best explanation we can give is the old one of "brain swelling," of extracellular and intracellular edema of the brain centers. To classify a cerebral edema type of uremia, as is done by a recent author, is entirely wrong, as this is only an occasional complication of acute nephritis and is never dependent upon actual kidney insufficiency.

We have mentioned so far the various forms of glomerulo-nephritis and have classified them into: an acute diffuse glomerulo-nephritis, a latent stage of chronic diffuse glomerulo-nephritis, and a terminal stage of chronic diffuse glomerulo-nephritis. We have also mentioned focal glomerulo-nephritis and embolic glomerulo-nephritis as not causing any kidney insufficiency and, therefore, no increase in blood pressure, no loss of variability of function and no increase in the rest nitrogen level in the blood.

In considering tubular involvement there is a good deal of dispute whether to use the term "nephritis" in connection with it or not. Aschoff insists upon the use of the term "tubular nephritis," while others, because of the purely degenerative character of the injury, refuse the use of this term. Fr. Muller has coined the word "nephrosis" for it, which is gradually finding acceptance by German writers.

Purely tubular injury without any glomerular involvement is characterized by marked albuminuria, cylindruria, edema and hydrops of the serous cavities. There is salt retention with the edema, whether because of the edema we do not know. Nor do we know the causative mechanism of the oedema. There is no increase in blood pressure, no loss of concentration ability, no increased rest nitrogen in the blood and no hematuria.

Such forms of pure tubular degeneration or nephrosis are found in the course of chronic suppuration, in tuberculosis, syphilis, diphtheria, and occasionally in other general infections. In many cases no etiology can be discovered. They may be complicated with amyloid deposit, which does not change the clinical picture.

As a special form of nephrosis, we must consider the pregnancy kidney. Here the clinical picture is complicated with eclamptic convulsions and increased blood pressure, which does not stand in any causal relation to the kidney affection, but is probably the result of the same poison causing the tubular degeneration in the kidney.

A nephrotic kidney without glomerular involvement is never a cause of death. When death occurs it is due to the causative disease or to some intercurrent affection. Convulsions never occur in pure nephroses.

Prognosis depends on the causative disease. Those of unknown etiology may last many years. Treatment is, of course, directed towards the etiological disease, and the edema and cavity hydrops can be controlled remarkably well by a salt-free and a dry diet.

As a special form we must also consider the sublimate kidney. In this condition, instead of a degeneration of tubules we have complete necrosis of tubules. The glomeruli are not affected. Clinically the mild cases are characterized by oliguria, marked albuminuria and cylindruria. In the severe form of bichloride poisoning, there is complete anuria, and with it retention of all the nitrogenous waste products in the blood, increase in blood pressure and the other signs of true uremia in so far as they are not overshadowed by other symptoms of mercury poisoning.

We may classify, therefore, tubular nephritis, or nephrosis, into: acute tubular nephritis or nephrosis, and chronic tubular nephritis or nephrosis, both with or without amyloid deposit, and the special form of necrotic tubular nephritis or nephrosis, of which the sublimate kidney is the prominent example.

Of the affections of the vessels of the kidney we have mentioned arteriosclerosis of the finer vessels, the commonest kidney affection, and presenting the well-known syndrome of hypertension with a sufficient kidney. There is no loss of variability of function, no loss of concentration ability, no increase of rest nitrogen in the blood. The symptoms are mostly cardiac, due to the relative insufficiency of the hypertrophied heart as a result of prolonged hypertension. Prognosis is good. The patient may carry his hypertension for twenty years, with periodical cardiac decompensation, which responds promptly to rest in bed, a dry and salt-free diet and digitalis. Death is usually due to cerebral hemorrhage or some other affection.

Lastly we must consider the other form of kidney sclerosis in which there is an arteriosclerosis of the finer and finest vessels, including the vasa afferentia of the glomeruli. To this there is added a glomerulo-nephritis, not involving all the glomeruli but rather focal in type, not of bacterial origin, but of unknown etiology, probably the result of toxins produced in the body. Volhard and Fahr have termed this the combination form, or malignant hypertension. To the symptoms of hypertension there are added here the symptoms of nephritis and kidney insufficiency, a blood pressure of 200 and above, complete loss of variability of function, specific gravity of the urine, practically fixed,

of about 1006, a gradually increasing rest nitrogen level in the blood, with the final symptoms of true uremia. There are various arterial symptoms due to arterial changes in the brain and elsewhere. Albuminuric retinitis is an early manifestation.

Prognosis is always bad. This form of malignant sclerosis always leads to death as a result of kidney insufficiency.

With these two forms of kidney sclerosis, namely, the benign sclerosis of kidney vessels or benign hypertension, and the malignant form of kidney sclerosis or malignant hypertension or combination form, we have classified practically all the various forms of Bright's disease.

It is at once evident that the classification of Bright's disease in this manner, and a knowledge of the principles underlying their individual symptomatology, give us a better view of the prognosis and definite indications for treatment. For this we are indebted to the epoch-making work of Volhard and Fahr, a book that should be read by everyone interested in kidney disease.

AN EPIDEMIC OF DYSENTERY AT THE BOSTON STATE HOSPITAL, DUE TO A MEMBER OF THE PARATYPHOID-ENTERITIDIS GROUP.

BY MARY ELIZABETH MORSE, M.D., BOSTON,
Pathologist to the Boston State Hospital,
AND
GENEVA TRYON, M.D., BOSTON,
Assistant Physician, Boston State Hospital.

[From the Laboratory of the Boston State Hospital.]

(Concluded from page 220)

The results of the agglutination tests with both human and rabbit sera illustrate well the group reactions, but further than that, are very difficult, or even impossible, to evaluate, in view of the complexity of agglutination reactions within the group. The outstanding result is that the present organism is not an ordinary *A* or *B*. It does not react to any extent, either, with anti-enteritidis or antisuipestifer serum, although its immune serum agglutinates both organisms. The high reactions with B. enteritidis should probably be discounted to some extent because of the easy agglutinability of the strain.

As to the place of the present organism within the paratyphoid group, it is impossible to say anything more definite than that it is not an ordinary A, B. enteritidis or suipestifer, but that, according to agglutinative affinities, it resembles the three latter more than *A*. It does not fit well into either of the chief divisions of the group as outlined by Sobernheim and Seligmann.[15] It might probably be considered as one of the C types.

IX. PATHOLOGY.

Autopsies were obtained on two cases in the spring epidemic of 1915, also on a patient who recovered from a severe attack and died five months later of other causes, and two cases of the milder form of the disease which prevailed in 1916.

The two acute virulent cases presented similar pathological pictures. The chief conditions found were: first, an acute fibrinous ileitis and colitis, from which an almost pure culture of the organism was obtained; second, a septicemia, the bacillus being isolated in pure culture from the heart's blood; third, cloudy swelling of the liver, with focal necroses in case 2; and fourth, a pneumonia of the septic type, with miliary abscesses and large areas of necrosis, from which the organism was recovered, associated with streptococci.

The intestine presented a striking appearance. The lesions began a short distance above the ileocaecal valve, involved the entire colon, and in the first case, the rectum also. The intestinal wall was thickened and covered with irregular patches of dirty yellow-gray exudate, interspersed with bright-red mucosa, frequently showing foci of hemorrhage. The membrane could be scraped off, leaving an eroded hemorrhagic surface. There were no ulcers and only very moderate swelling of Peyer's patches. The regional lymph-nodes were enlarged and injected. Microscopically the intestine showed a necrosis extending inward for varying distances, sometimes converting the entire mucosa into a fibrinous membrane. The latter had sloughed in various small areas, exposing the extremely edematous submucosa. The exudate was composed of lymphoid and plasma cells; polymorphonuclears where fibrin was present, and large phagocytic endothelial cells. The latter were present in some sections in considerable numbers but were not as abundant as in the intestinal lesions of typhoid fever.

The pneumonic exudate was characterized by phagocytic cells, similar to those in the intestine, but more numerous. Small numbers were also found in the mesenteric lymph-nodes, but none in the liver.

Condensed summaries of the protocols are as follows:

CASE 1. R. K. (A-15-23) aged 50. A much demented case of Korsakow's psychosis, in hospital two years. Died on fifth day of dysentery. Autopsy five hours post mortem. Body well built, well nourished. Body heat and rigor mortis present.

Ventral Section. Small amount of free fluid in pelvic cavity.

Thorax. Recent adhesions over posterior portions of each lung. No excess of fluid in pleural cavities.

Heart. Weight 300 gms. Valves normal. Myocardium somewhat friable and endocardium gray. The descending branches of both coronaries show occasional plaques.

Lungs. Right: Weight 295 gms. Posterior portion is markedly congested. Remainder of lung is normal. Left: weight 570 gms. The upper part of the upper lobe is normal. The inferior portion of the upper lobe and the entire lower lobe are enlarged, deep red, firm and nodular. Cut surface is consolidated, reddish purple and is beset with dull gray foci ½ mm. in diameter, sometimes depressed in the centre. A large amount of thin purulent fluid can be expressed from the tissue.

Bronchi are deep red and covered with purulent fluid.

Abdomen.

Spleen. Weight 105 gms. Firm, purple-red on section. Malpighian bodies just visible.

Liver. Weight 1450 gms. Capsule normal. Cut surface shows a yellow-brown mottling with indistinct lobulation. Consistence soft.

Gall Bladder. Distended; no stones or adhesions.

Gastro-intestinal Tract. Stomach, duodenum, jejunum and upper ileum negative. The lower third of the ileum is thickened and edematous. The mucosa is swollen and red, and is irregularly covered with a granular yellow-gray exudate. From cecum to anus the intestinal wall is edematous, and the mucosa is covered with a shaggy membrane which follows the rugae. On scraping off the membrane a hemorrhagic and eroded surface presents. No ulcers found.

Lymph Nodes in the vicinity of the cecum are enlarged, soft and grayish pink.

Pancreas shows some injection; otherwise negative.

Kidneys. Combined weight 290 gms. Capsules are thickened. Cortex measures from .2 to .6 mm.; is gray, with areas of injection. Pyramids dark red with a white streak at the bases.

Adrenals show central softening; otherwise not remarkable.

Bladder. Negative.

Uterus. Pedunculated myoma, 1 cm. in diameter, on posterior surface.

Retroperitoneal Tissues. Negative.

Organs of the Neck. Negative.

Head. Calvarium, thick. Dura not adherent; is moderately thickened along the longitudinal fissure. Sinuses negative. Pia thickened on inferior surface of cerebellum; not elsewhere.

Brain. Weight *in toto* 1350 gms. Marked atrophy of the convolutions of the frontal, central and parietal regions, most prominent in the frontal fields, and decreasing posteriorly. Consistency of the brain is everywhere increased.

Microscopical Examination.

Lungs. Section through one of the pneumonic areas. These are situated around fairly large vessels. At the edges of the lesion the capillaries are distended. In the centre of the focus the alveoli are filled with cellular exudate mixed with considerable fibrin and serum, and there are small areas of hemorrhage. The exudate consists of polymorphonuclear leukocytes and large phagocytic cells. The latter often reach large size (five or six times the diameter of a red corpuscle), have a coarse-meshed cytoplasm, and contain red corpuscles, pigment and polymorphonuclears. Three or four of these cells are often present in a single alveolus. In several places the alveoli are filled with solid masses of bacteria. The alveolar partitions are frequently dissolved in the centre of the consolidated areas. The large veins show very marked inflammation. Sections through the abscesses show extensive foci of necrosis with masses of bacteria and fibrin in the centre, surrounded by a zone of degenerated leukocytes. The bronchioles are intensely affected, the epithelium being absent, the walls infiltrated with fragmented leukocytes and the normal structures obscured.

Heart. Perinuclear pigment prominent; otherwise nothing notable.

Liver. The liver cells are indistinct in outline; their cytoplasm stains a dull granular pink, and the nuclei are pyknotic or stain faintly. Fat content is very moderate. Collections of lymphocytes about the bile ducts are frequent, and the sinusoids are dilated. No necroses or phagocytic cells.

Spleen. Lymphoid tissue is small in amount. Pulp contains much blood and collections of golden brown pigment. No phagocytes.

Gastro-intestinal Tract. Stomach: Nothing noteworthy. Intestine: Sections from various parts of the lower ileum and the colon show the following picture: At the edges of an affected area there is a superficial necrosis with fibrin network. The underlying blood vessels are engorged, the glands choked with desquamated epithelium and debris and the mucosa thickly infiltrated with polymorphonuclears. The submucosa is extremely edematous and is infiltrated with lymphocytes, plasma and large phagocytic cells, similar to those found in the lung. The vascular endothelium is swollen and the vessel walls infiltrated. Large numbers of bacilli are scattered free throughout the mucosa and submucosa. The muscularis contains clumps of large phagocytic cells situated about the vessels. In more advanced areas the necrosis extends deeply into the mucosa, and the submucosa shows areas of hemorrhage and a moderate infiltration of polymorphonuclears. The vessels in the necrotic areas are frequently filled with thrombi of fibrin and leukocytes. In the most advanced portions the entire mucosa is converted into a membrane of necrotic tissue, fibrin, polymorphonuclear leukocytes and masses of bacteria. The membrane has sloughed in numerous areas, exposing the submucosa. The necrosis and sloughing is irregular in distribution and depth. The lymphoid tissue is not hyperplastic.

Mesenteric Lymph Nodes. No hyperplasia of lymphoid tissue. Large endothelial cells, phagocytic for lymphocytes and red corpuscles are very numerous.

Adrenals. The cortical cells stain well in general and are much vacuolated. Small collections of lymphocytes with a few plasma cells in the reticulosa.

The other organs showed nothing of note. The brain and cord revealed no lesions which could be correlated with the acute infection, and the description of them is, therefore, omitted.

Cultures.

Heart's Blood. Epidemic organism in pure culture.

Consolidated Area of Lung. Epidemic organism plus a few colonies of streptococci.

Wall of Cecum. Epidemic organism in abundance on Congo red plates.

Lymph Node near Cecum. No growth for three days, then scattered colonies of staphylococcus albus and streptococci.

Cerebro-spinal Fluid. Sterile.

Anatomical Diagnosis. Acute membranous ileitis and colitis, septicemia, septic pneumonia with abscess formation, acute fibrinous pleuritis, purulent

bronchitis, cloudy swelling of liver, myoma uteri, cerebral atrophy.

CASE 2. E. H., aged 63 (A-15-24) paranoid dementia praecox. Hospital residence three years. Died on the eighth day of illness. Autopsy 26 hours after death. Body of a somewhat obese woman. Some distention of abdomen.

Ventral Section. Omentum contains much fat, and in its lower third is adherent to the peritoneal wall. Spleen is bound down by adhesions. No free fluid in peritoneal cavity. The intestines are injected, especially the ascending, transverse and descending colon. Subserous hemorrhages are visible in the cecum.

Thorax. A few light adhesions over the posterior portion of the left base; otherwise the pleural cavities are free and contain no excess of fluid. Pericardial sac contains a slight excess of fluid.

Heart. Weight 450 gms. Epicardial fat abundant. Slight thickening of the edges of the tricuspid and the bases of the aortic valves. Myocardium flabby. Right coronary shows a few small plaques.

Lungs. Right, weight 550 gms; left, 530 gms. Both lungs show scars at apices. Upper lobes not remarkable. The posterior portion of the left lower lobe is enlarged, bluish red and firm. Tissue sinks in water, and, on section, discloses an evenly consolidated red surface with multiple clusters of yellow dots, 3 mm. in diameter, arranged around the bronchioles. The right lower lobe is consolidated but does not show miliary abscesses.

Peribronchial Lymph Nodes moderately enlarged.

Spleen. Weight 70 gms. Trabeculae faint; pulp bright red; Malpighian bodies small.

Liver. Weight 2000 gms. Is adherent to the diaphragm. Shape and capsule not remarkable. Cut surface is yellowish red, and normal markings are indistinct. Consistence soft.

Gall Bladder. Distended; otherwise not notable.

Gastro-intestinal Tract. Esophagus markedly injected. Stomach contains fecal material. The intestine is negative to within 6 cm. of the ileocecal valve. The mucosa of the remaining portion of the ileum is thickened, injected and granular. From the ileocecal valve to the splenic flexure the wall is thick and stiff and the mucosa shows areas of membrane and erosion, but these are not as extensive as in Case 1. The descending colon is less involved and the rectum is comparatively free. No swelling of the lymphoid tissue.

Kidneys. Combined weight 320 gms. Capsules strip easily. Cortex is 6 to 7 mm. in depth and is gray, with foci of injection. Glomeruli not visible.

Adrenals. Markedly softened.

Bladder. Mucosa is granular and injected at the trigone. Urine cloudy.

Uterus. Cavity contains a small amount of turbid fluid.

Calvarium. Of moderate thickness with small amount of diploe. Dura is adherent to inner table. Pia is lifted from the brain surface by a large amount of fluid; is of normal thickness.

Brain. Weight *in toto* 1440 gms. Convolutional pattern is simple. No atrophy. Consistence is uniformly increased over the dome. Structures at base negative. Basal vessels free from sclerosis.

The *microscopic findings* in the lungs and intestine were similar in all particulars to Case 1, and need not be detailed. The liver showed foci of necrosis, and there was also a chronic thyroiditis.

Cultures. The organism was recovered in pure culture from the heart's blood and urine and, in large numbers, from the wall of the colon. In the lung it was associated with staphylococcus albus and aureus.

Anatomical Diagnosis. Acute membranous ileitis and colitis, septicemia, septic pneumonia with miliary abscesses, focal necroses of the liver, acute fibrinous pleuritis, cardiac hypertrophy and dilatation, chronic fibrous endocarditis, mitral and aortic, acute cystitis, subpial edema.

CASE 3. E. McK., aged 76 (A-15-41) showed conditions four months after recovery from a severe attack.

The patient, a senile dement, died of bronchopneumonia, chronic interstitial nephritis and general arteriosclerosis. The intestine, to within a foot of the ileocecal valve, was normal. Throughout the remainder of the bowel were numerous foci of injection in the mucosa, in some places limited to the crests of the folds, in others spread over several centimeters of the mucosa. The mucosa was not thickened, the lymphoid tissue not increased, nor were there signs of healed ulcers. Mesenteric lymph-nodes small. The gall bladder contained dark, viscid bile and the lining was not remarkable.

Microscopically, in the injected areas of the intestine the superficial epithelium was absent, and near the surface of the mucosa were numerous large vacuolated mononuclear cells, occasionally containing the remnants of red corpuscles. The mucosa also showed numerous plasma cells and a few eosinophilic leukocytes. The outer coats of the intestine were normal.

Cultures from the intestinal wall, feces, mesenteric lymph nodes and bile did not yield the epidemic organism.

Cases 4 and 5 show the condition of the intestine a few days after an attack of moderate severity. Both patients had blood and mucus in the stools, and died several days after the height of the attack. In both, also, the dysentery was merely the terminal event in the course of organic conditions fatal in themselves.

CASE 4. (A-16-21) was a bed ridden paretic. The mucosa of the lower ileum was slightly thickened and moderately congested. The mucosa of the upper half of the large intestine was uniformly congested but not thickened. In the lower half of the large intestine the wall was moderately thickened and the mucosa dull gray and granular, with patches of congestion but no membrane or loss of substance. The feces in the lower intestine were fluid, gray, slightly frothy, not offensive. Microscopically there was a loss of superficial epithelium and masses of bacteria in the glands, but practically no cellular reaction and no changes below the mucosa.

CASE 5. (A-16-24) was a senile dement who had an advanced chronic myocarditis and an internal hemorrhagic pachymeningitis. The mucosa of the cecum was hemorrhagic, and from there on through the rectum the wall was moderately edematous, showed large areas of congestion and, in places, also prominent mucous glands. The lesion was most marked in the sigmoid and upper part of the rectum where the entire mucosa was velvety and dusky. Feces were soft and yellow. Sections showed some

slight superficial necrosis, some small localized losses of substance extending into the submucosa, moderate edema of the latter, and considerable swelling of the lymphoid tissue. An occasional phagocytic endothelial cell was found, also moderate numbers of neutrophilic and quite numerous eosinophilic polymorphonuclears.

The organism was isolated in pure culture from the heart's blood of this case.

It is evident from the last two autopsies that in the cases of moderate severity there is nothing striking or characteristic about either the gross or microscopic picture, of the intestine, as there is in the virulent cases, but the conditions are such as might be found in any mild inflammation of the bowel.

Pathologically, the acute fatal cases differ obviously from bacillary dysentery in the presence of a septicemia and pneumonia, as well as in the absence of intestinal ulcers. The invasion of the blood stream, particularly, allies the disease with paratypoid infection. The intestinal lesions, as well as the course of the disease, are more acute and violent than those of bacillary dysentery.

The pathological anatomy of paratyphoid infections is incompletely known, as until recently comparatively few autopsies had been done on either the typhoid or gastro-enteric forms. Since the outbreak of the war autopsy reports have been accumulating. In general the results are that paratyphoid has more tendency to involve the large bowel than does typhoid; that the lymphoid tissue of the intestine is only moderately affected; that ulcers are frequently absent, and when present, are usually scattered and small. The histology of the lesions appears not to have been especially considered. Job and Ballet[16] give the findings in four cases of paratyphoid fever (one *B* and 3 *A*) as intense congestion of the viscera, a moderate degree of inflammation of Peyer's patches without ulceration; swelling, infiltration and congestion of the abdominal lymph glands, and intense inflammation of the spleen, with lymphoid infiltration and hemorrhage.

As to the dysenteric form, Stollkind[4] says that 10 cases with lesions similar to dysentery have been reported. Korczyski[5] found in the enteric form of his cases acute hyperemia of the jejunum and ileum, hemorrhage into the mucosa and occasional small ulcers; in the dysenteric form the same changes, with the addition of an inflammatory process in the large intestine, with thickening of the mucosa and ulcers, which could scarcely be distinguished from Shiga dysentery. He did not find extensive necrosis.

In the gastro-enteric form, the most acute cases may show no microscopic lesion except punctiform hemorrhages through the entire gastrointestinal tract.[3] In more prolonged cases there may be swelling of the lymphoid tissue, ulceration, and even gangrene of the intestine. The majority of the few reported autopsies on cases dying a week or more after onset have shown hemorrhagic inflammation of the ileum, hyperplasia of the lymphoid tissue and frequently ulcers.

None of these conditions agrees with the virulent form of the present disease, which is an acute extensive membranous inflammation of the lower ileum and the colon without gross ulceration or hyperplasia of the lymphoid tissue, and combined with septicemia and pneumonia of the septic type, characterized by large areas of necrosis.

The finding of streptococci in the urine of two cases and in the lung of one case, combined with the epidemic organism, suggests that in fatal cases this may be a secondary complication of importance.

As to a possible relation of the disease to hog cholera, we have no crucial evidence, having failed to isolate an identical bacillus from the hog cholera animal. One is struck, however, by certain points of similarity in the pathology of the present disease and that of hog cholera, particularly the simultaneous involvent of the intestines and the lungs. The intestines in hog cholera may present various appearances—from simple catarrh to hemorrhagic or diphtheritic inflammation. The most frequent form of pulmonary involvement is an acute fibrinous necrotic pneumonia. Organisms of the paratyphoid group are most frequently found in the lungs and spleen. Uhlenhuth and Handel[17] bring up the question whether there may not be two diseases included under hog cholera, one, very contagious, caused by an ultra microscopic virus, and a second, slightly contagious, by B. suipestifer.

X. ANIMAL EXPERIMENTATION

The pathogenicity of the organism was tested on rabbits weighing from 1800 to 2000 gms., by both intravenous and subcutaneous inoculation and by feeding experiments.

One tenth of a cubic centimeter of a 24 hour broth culture of a freshly isolated strain given subcutaneously produced no symptoms at the end of three days. There was no local reaction, and the animal was lively and ate well.

Two tenths of a cubic centimeter of a 24 hour broth culture intravenously killed an animal over night. The most striking lesion at autopsy was an extensive necrosis of the liver Other changes were cloudy swelling of the myocardium and renal epithelium, and diffuse degenerative changes in the cortical nerve cells. The gastro-intestinal tract was negative.

Another rabbit, which in the beginning of the experimentation was given a massive dose of the organism intravenously (.1 ccm. of a moderately thick suspension of a 24 hour agar culture) died over night, showed the above mentioned lesions, in heart, liver, kidneys, thymus and brain, and in addition, hemorrhage into the small intestine. The intestinal mucosa was thick, velvety,

and deep red. The bacillus was isolated from the blood and bile, but not from the hemorrhagic intestinal contents.

A fourth rabbit was fed 1 cc. of a 24 hour bouillon culture on carrot once a day for three successive days, after which it was fed sparingly on lettuce and carrots once a day. It remained lively, ate well, had no diarrhea, and its temperature was not abnormally high or irregular. It, however, emaciated rapidly and on the eighth day suddenly died. Autopsy showed an atrophic condition of liver and spleen. The mesenteric lymphnodes were enlarged, soft and of a deep red color. The gastrointestinal tract was not remarkable macroscopically, and the feces were normal. Microscopically, however, there was found at several points in the small and large intestine a necrosis of the superficial epithelium. The surface in these areas was covered with a thick layer of degenerated cells, mingled with masses of bacteria and scattered polymorphonuclear leucocytes. Numerous plasma cells were present in the underlying mucosa, but the remainder of the intestinal wall was negative. There was hemorrhage in the centers of the enlarged lymph nodes; the lymphoid tissue was active; small numbers of mononuclears, phagocytic for lymphocytes, were present, and a large amount of pigment, both intra- and extra-cellular. The liver showed areas of hemorrhage, but no cloudy swelling or necrosis. The spleen contained numerous endothelial cells, phagocytic for pigment. The other organs were not remarkable. Staphylococcus albus was present in pure culture in the heart's blood and the bile. The urine was sterile.

These results show as far as they go that no condition at all resembling the human disease was produced in rabbits by subcutaneous, intravenous or oral administration of the organism. Ordway[18] produced in rabbits a typhoid-like disease by subcutaneous inoculation of another member of this group, B. suipestifer. The constant and most characteristic lesions were necrosis of the liver. The intestinal lesions, which were less constant and striking, consisted in swelling of Peyer's patches and endothelial proliferation.

SUMMARY.

An acute very contagious disease, of short incubation period, appearing in three forms: the dysentero-septicemic-pneumonic; the pure dysenteric, and the diarrheal. The conditions found in the virulent fatal cases were a membranous ileocolitis, septicemia and a pneumonia with miliary abscesses and large areas of necrosis. The severer forms of the disease occur in debilitated persons. Immunity is of short duration, and recurrences (usually mild) are frequent.

The causative organism is a member of the paratyphoid-enteritidis group, more closely allied, as shown by agglutination tests, with paratyphoid *B*, B. suipestifer and B. enteritidis than with *A*, but not identical with any of them.

The disease was limited to certain buildings of the West Group of the Boston State Hospital. The epidemic was preceded by mild diarrheas among patients and attendants, then broke out in violence in one ward, and was passed from person to person by contact. The source of the infection was not definitely determined. The close affinity of the organism with certain members of the group (suipestifer and enteritidis) which are associated with animals, suggests the possibility of such an origin. No evidence was obtained connecting the human epidemic with an outbreak of hog cholera which had prevailed in the piggery at the West Group during the previous summer, but the pathological anatomy of the two diseases presents certain features of similarity. The hypothesis is suggested that the infection was introduced by the contamination of food in the West Group refrigerator by rats, the infection appearing first as mild cases of diarrhea, then as an outbreak on a single ward, due probably to gross contamination of the food by a human carrier, the difference in the severity of the disease depending on the physical condition of the persons attacked, and possibly also on the rapid transfer of the virus. The disease has now become endemic and has assumed a mild form.

Prophylatic inoculation will not suppress the disease among feeble patients, although it may have some influence in mitigating its severity. Among strong persons, however, it appears to be of more value, in reducing both the number of cases and the type of the disease. Vaccine treatment during the disease has given good results.

A polymorphonuclear hyperleucocytosis occurs after both the prophylactic and therapeutic administration of vaccine. The leukocytic reaction is more marked in the stronger normal individuals than in the feeble ones who have had the disease and recurrent attacks.

Agglutinin formation in the disease is very moderate. Agglutinins for the organism persist in some cases as long as 14 and 17 months after the original attack, when there has been no recurrence. After prophylactic vaccination low titres have been obtained up to 11 months.

Intradermal tests with concentrated glycerin broth cultures of members of the paratyphoid-enteritidis group have given unreliable and conflicting results. Tests with powdered cultures are to be undertaken.

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Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

THE forty-eighth meeting of the New England Pediatric Society was held in the Boston Medical Library, Friday, March 30, 1917, at 8.15 p.m.

The President, Dr. Maynard Ladd of Boston, in the chair.

The following papers were read:—

1. Studies in Infant Feeding; The Mineral Constituents of Milk,* Henry I. Bowditch, M.D., Boston, Alfred W. Bosworth, Boston.
2. Anemia of the Newborn, Karlton G. Percy, M.D., Boston.
3. Nephritis in Childhood, with Especial Reference to Functional Tests, Lewis W. Hill, M.D., Boston.

UNUSUALLY SEVERE ANEMIA IN THE NEWBORN, WITH DEATH.

ABSTRACT.

BY KARLTON G. PERCY, M.D., BOSTON.

EIGHTH child, healthy parents, three brothers and sisters dead of the same apparent disease within 12 days of life. Other sisters and brothers well. Normal delivery; normal baby for 3 days. Rapidly increasing anemia, without apparent fever, hemorrhages or signs of sepsis. Seen on eighth day. Hgb., 18%; red blood cells, 2,100,000; white blood cells, 18,000. Smear showed moderate polychromatophilis, poikilocytosis, anisocytosis, stippling and increased platelets. Eighteen nucleated reds to 100 white cells. White cells, showing mono-nuclearcytosis, with a tendency of cells to be of primordial type. Wassermann negative. Parents' Wassermann negative. Transfusion, 50 cc., paternal blood, without apparent benefit, and death within eighteen hours. Autopsy showed only excessively active red and white blood cell-formation in spleen, liver, possibly thymus and lymph glands.

Bone marrow not examined. The general picture of the case simulated a severe secondary anemia of infancy, described by Germans as pseudo leukemia infantum.

DISCUSSION.

DR. HOWARD: In going over the literature of the blood recently, I have been much impressed with the lack of definite knowledge as to the normal blood in infancy and children, and the still greater lack of definite knowledge apparent in regard to blood diseases in infancy. The full report of studied cases, such as Dr. Percy's, is extremely valuable and necessary for a better understanding of infant blood.

It is to be regretted that in Dr. Percy's case the bone marrow was not examined, as this is a most important part of the blood picture, and almost essential in determining the classification and diagnosis of this case. The history and blood picture, as given, do not seem to me to place this case definitely in any one of the groups of blood diseases of children. I agree with Dr. Percy that the evidence is against an idiopathic aplastic anemia, neither does the case seem to be one of the group known as secondary aplastic anemias. Secondary aplastic anemia can perhaps not be definitely ruled out in the absence of any information as to whether or not the bone marrow was failing to produce one of the elements of the blood—the red corpuscles. The blood picture, however, showing normoblasts and megaloblasts, plenty of blood platelets, and no reduction in polynuclear cells, is very much against the existence of a depression of the blood-forming activity of the marrow, and strongly suggests that the blood-forming function of the bone marrow is, on the contrary, being worked overtime.

Diagnosing this case as a lymphatic leukemia of any type, seems to me open to criticism, as, first, there is no enlargement of the lymph nodes; second, there is no lymphocytosis; third, there is no record of myelocytes in the blood picture.

From the blood picture presented, without knowledge of the condition of the bone marrow, the weight of evidence is in favor of a destructive process confined to the red blood cells, rather than the picture of a definite disease, such as lymphatic leukemia or aplastic anemia of any type. The history of the case and the blood picture give us but little help in determining the etiology of this destructive process. The most suggestive point is the jaundice, which, in this case, we have evidence, is not an obstructive jaundice, and which, we have reason to believe, may not be a simple jaundice of the newborn. This jaundice, it seems to me, may be regarded, in its relation to the blood picture, in either of two ways: It may be due to a toxin,—the same toxin that produced the jaundice causing the destruction of the red blood cells; the other possibility being that it is a hemolytic jaundice, the jaundice in that case being caused by a toxin, and the jaundice causing secondarily red blood cell destruction and anemia.

DR. PERCY: I may add that I am sorry that there was no bone marrow examination done in this case. It was one of those slips which occasionally happens. Yet the differentiation between this type of secondary anemia or pseudo leukemia infantum, and aplastic anemia is shown not only by the ability of the bone marrow to regenerate, but by the presence of regeneration in the other organs of the body. This case did not show any special evidences of other destruction, but it showed a tremendous anemia without any cause, and yet a very definite attempt at regeneration.

In closing I would like to ask if anybody has any suggestions for future babies in this family. The parents are French Canadians; there are apparently going to be more, and if the next one is going to have the same disease as the three who have already died, I would like suggestions as to its treatment.

* See JOURNAL, page 248.

The term "pseudo leukemia" is one which is used by the Germans, following Naegeli's nomenclature, for a type of case which shows a symptom-complex with marked anemia, enlarged liver, enlarged spleen and a relatively high white count,—that is, a white count above the normal (10,000 or over), with a tendency for the red cells to be regenerated, to show nucleated reds, to show an increased number of platelets; for the white cells to show a tendency toward an abnormal lymphatic picture, and not one of a true myelogenous leukemia; and the finding of definite hyperhematopoiesis and activity in the bone marrow, in the spleen, the liver, the lymph nodes, and possibly in the thymus. Thus, pseudo leukemia is simply a name for those cases in infants with enlarged spleen and with that blood picture, which has been used and is being used by the Germans. It has no connection with von Jacksh's original paper, because his type of anemia was a symptom-complex due to various diseases,—rickets, tuberculosis and syphilis. This case of mine pathologically falls definitely into Naegeli's type of anemia, without any known etiological factor.

DR. R. M. SMITH (Dr. Hill's paper): We are grateful to Dr. Hill for presenting this subject in such a clear manner. As Dr. Coues has just suggested, there is a good deal of work being done in investigating the bacteriology of the urine. It has been shown that in many infectious diseases the organisms are present in the urine. This raises the question whether the nephritis which complicates often the infectious disease, such as tonsillitis, is due exclusively to the toxin of the bacteria, or whether it is due to the direct action of the bacteria in the kidneys.

The hemorrhagic type of nephritis which Dr. Hill has mentioned is often difficult to differentiate from hemorrhagic pyelitis. I have seen quite a number of cases which on first investigation seemed to be hemorrhagic nephritis, which subsequently proved to be pyelitis, with a good deal of bleeding. The picture of the two conditions is not dissimilar. The large amount of blood is a common characteristic, and the casts, which are few in number, are present in both conditions.

I was interested in what Dr. Hill had to say about renal function tests. I think that all agree that the phenolphthalein test is valuable, primarily as a prognostic sign. Most of Dr. Hill's cases did well and the function test was high, but other investigators have reported low function tests, and in the majority of instances these patients did poorly.

DR. PERCY: In regard to the etiology of nephritis, as to whether it is due to toxins or to hematogenous infection from the bacteria themselves, the work of Rosenow of Chicago is of interest in nephritis of childhood. I believe that many positive blood cultures could be obtained early in nephritis, whereby we could feel sure that a damage to the kidney was of actual bacterial origin. We have recently proven the hematogenous bacterial etiology in pyelitis, and recently I have seen a case of nephritis of moderate severity which ran a mild course, from which we recovered streptococci, both from the blood and from the urine, and I believe further blood culture work will show that the kidney itself is infected directly by blood-borne bacteria.

DR. COUES: I would like to hear Dr. Hill's views with regard to the question of pyelitis. Does he consider that we can make a hard and fast line in cases of pyelitis and say that the rest of the kidney may not be involved? Should not pyelitis be considered as part of a more general kidney infection?

DR. HILL (in closing): I think it is sometimes very hard to tell whether one is dealing with a case of pyelitis or one of these cases of hemorrhagic nephritis. It is hard, as Dr. Smith has said, and I am not sure whether some of my cases ought to be put into the pyelitis, instead of the nephritis, class. If we see a good many casts in the urine we call it nephritis, but in some of those cases that I have classified as nephritis there have been about equal parts of pus and blood and a few casts, and we may have been wrong in including those in the nephritis rather than in the pyelitis class.

As to the bacteriology of the urine, I wish that I had been able to make urine cultures on the cases that we have had at the hospital, but intend to do it later if there is a chance.

As to the function tests—I think that Dr. Smith is quite right about the value of the low test, and I attach very little importance, indeed, to a high functional test in a child. With a *high* test one cannot tell that a person has a normal kidney, but with repeated *low* tests one knows that the proper functioning is impaired, and is of some value in the prognosis of the long-drawn-out chronic cases. The functional tests in children are, however, of very little value in the *diagnosis* of nephritis.

Book Reviews.

Progressive Medicine. Vol. XX, No. 1. Edited by HOBART AMORY HARE, M.D., assisted by LEIGHTON F. APPLEMAN, M.D. Philadelphia and New York: Lea and Febiger. 1917.

This first issue, for the current year, of a standard medical digest of advances, discoveries and improvements in medical and surgical sciences, consists of reviews of surgery of the head and neck by Dr. Charles H. Frazier, and of the thorax by Dr. George P. Müller, which compose a third of the volume. Another third is occupied by Dr. John Ruhräh's review of infectious diseases, including acute rheumatism, croupous pneumonia and influenza. The remainder is divided between the diseases of children by Dr. Floyd M. Crandall, and rhinology, laryngology and otology, by Dr. George M. Coates. The surgical sections are particularly well illustrated with descriptive figures, of which there is a total of twenty-three. The publication continues its usefulness to those who have the inclination and time to maintain a constant familiarity with the advance of medical science.

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ERNEST GREGORY, *Manager,*

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A CRITICAL SITUATION.

THE Government is raising an immense army of volunteers and conscripts to carry on the war to a successful and, we hope, an early termination. Every army must be supplied with a personnel of medical officers of adequate number and well trained. While provisions have been made to raise the required number of men for the fighting force, it has been left to members of the medical profession of this country to come forward voluntarily, seeking commissions in the Medical Reserve Corps.

Only a few of the total number required have applied for commissions. This means that unless immediate action is taken by the profession voluntarily, the men in the army now being organized will be without sufficient medical care. Such a condition would be more than critical and dangerous for the success of our army and the cause in which we are enlisted. The medical officer plays a most prominent part not only in keeping the army on its feet and physically fit for fighting, but in returning to the ranks a large percentage of those who have been temporarily put out through casualties.

How soon will the medical profession of the United States, as a whole, wake up and realize that doctors must come forward and volunteer their services to the Government? In civil life, when great casualties occur, the doctor readily offers his services and usually is the first on the scene to save human life. How much more important is it, then, that in this critical situation, he should come forward and offer his valuable aid to preserve not only human lives, but the life of the nation itself? Application blanks for commissions in the Medical Reserve Corps are being printed in many medical journals or will be sent by the Surgeon-General's Office, or can be secured from members of the Local Board of Examiners.

MASSACHUSETTS NARCOTIC DRUG LAWS.

IN another column of this issue of the JOURNAL we publish in full the text of the latest General Act (Chap. 275) relative to the sale and distribution of narcotic drugs, which went into effect in Massachusetts on June 23, 1917. This act, which is based upon the report (No. 149) to the Legislature of a special commission consisting of Dr. Frank G. Wheatley, Mr. Herman C. Lythgoe, and Mr. Abraham C. Webber, is very far-reaching and very important. Probably few physicians in this Commonwealth are conversant with it, or know of its drastic provisions against the possession or sale of a hypodermic syringe. The careful perusal of this act, therefore, is earnestly commended to members of the profession. Especial attention is directed to the requirement that the age of the patient must be put on each prescription containing a narcotic drug; that no such prescription may be filled after five days from the date of its issue; and that the patient obtaining the medicine must sign his or her name on the face of the prescription.

Probably few physicians also know that there is in existence a further law (Chap. 232) relative to the licensing of private hospitals and the admission therein of certain patients, which

admits of sending drug addicts to hospitals without court proceeding and attendant publicity; nor do they realize that no records of such cases can be used as evidence in a court of law, which is a matter of great protection in the event of subsequent suit for divorce or the breaking of a will. The complete text of this act, as approved on May 9, 1917, is as follows:

"Section 1. Chapter two hundred and eighty-five of the General Acts of the year nineteen hundred and sixteen is hereby amended by striking out section six and inserting in place thereof the following:—*Section 6.* The commission may annually license any suitable person to establish or have charge of a hospital or private house for the care and treatment of the insane, epileptic, feeble-minded, and persons addicted to the intemperate use of narcotics or stimulants, and may at any time revoke the license. No such license shall be granted for the care and treatment of insane or epileptic persons unless the said commission is satisfied, after investigation, that the person applying therefor is a duly qualified physician, as provided in section thirty-two of chapter five hundred and four of the acts of the year nineteen hundred and nine, and has had practical experience in the care and treatment of such patients. No such license shall be granted for the care and treatment of persons addicted to the intemperate use of narcotics or stimulants unless the commission is satisfied, after investigation, that the person applying therefor is a physician who is a graduate of a legally chartered medical school or college; that he has been in the actual practice of medicine for the three years next preceding his application for a license, nor unless his standing, character and professional knowledge of inebriety are satisfactory to the commission. Licenses granted hereunder shall expire with the last day of the calendar year in which they are issued, but may be renewed. The commission shall have power to fix reasonable fees for said licenses and renewals thereof.

Section 2. Said chapter two hundred and eighty-five is hereby further amended by striking out section seven and inserting in place thereof the following:—*Section 7.* Whoever keeps or maintains a hospital or private house for the care or treatment of the insane, epileptic, feeble-minded or persons addicted to the intemperate use of narcotics or stimulants, unless the same is in charge of and under the direct personal supervision of, a person duly licensed under this act, shall be guilty of a misdemeanor, and shall be punished by a fine of not more than five hundred dollars.

Section 3. The superintendent or manager of any hospital or private house licensed for the care and treatment of persons addicted to the intemperate use of narcotics or stimulants may, when requested by a physician, by a member of the board of health or a police officer of a city or town, by an agent of the institutions registration department of the city of Boston, by a member of the district police, or by the wife, husband, guardian or, in the case of an unmarried person having no guardian, by the next of kin, receive and care for in such hospital, as a patient for a period not exceeding fifteen days, any person who needs immediate care and treatment because he has become so addicted to the intemperate use of narcotics or stimulants that he has lost the power of self-control. Such request for the admission of a patient shall be made in writing and filed at the hospital at the time of his reception, or within twenty-four hours thereafter, together with a statement, in a form prescribed by the commission, giving such information as the commission may deem appropriate. The trustees, superintendent or manager of such hospitals or private houses shall cause to be kept a record, in such form as the commission may require, of each case treated therein, which shall at all times be open to the inspection of the commission and its agents. Such records shall not be a public record, nor shall the same be received as evidence in any legal proceeding. The superintendent or manager of such a hospital shall not detain any person received as above for more than fifteen days, unless, before the expiration of that period, such person shall have been committed or has signed a request to remain."

All physicians practising in this Commonwealth are again earnestly urged carefully to read these two acts in order that they may be intelligently familiar with the latest and present provisions of the Massachusetts Narcotic Drug Laws.

MEDICAL NOTES.

Death Rates In London.—Statistics recently published show that in May the total death rate of London was only 13.9, and in June, 12 per thousand inhabitants living. Among the several districts and boroughs in May, the highest rate was 17.2 in Holborn, a crowded central slum, and the lowest was 9.1 in Hampstead, an open district on the north. In June the highest rate was 18.1 in Holborn, and the lowest was 8.7 in Lewisham, an open district on the south.

Medical Students In Switzerland.—A recent report shows that the total number of medical students in the five Swiss universities during the winter semester of 1916-1917, was 1901. These were distributed as follows:

Bâle had 215, among whom were 12 women; there were 47 foreign students, of whom 2 were

women. Berne had 411, among whom were 45 women; there were 168 foreigners, of whom 29 were women. Geneva had 512, of whom 110 were women; there were 333 foreigners, of whom 90 were women. Lausanne had 248, of whom 35 were women; there were 97 foreigners, of whom 23 were women. Zürich had 515, of whom 89 were women; there were 182 foreigners, of whom 42 were women.

PREVALENCE OF DISEASE IN THE UNITED STATES.—The weekly report of the United States Public Health Service for July 27, 1917, states that during the month of June there were fifty-eight cases of cerebrospinal meningitis in Ohio, 213 of malaria and 79 of pellagra in Lousiana, 229 cases of smallpox in Kansas, 279 in Minnesota and 419 in Ohio. There were 242 cases of typhoid fever in Louisiana. The same bulletin contains a report on malaria in Louisiana, particularly with reference to its prevalence and geographic distribution.

WAR NOTES.

RED CROSS APPROPRIATION.—It is reported that the Amercian Red Cross has appropriated $800,000 to meet sanitary emergencies in the civilian areas surrounding army cantonments. A bureau under the direction of Dr. W. H. Frost, of the Public Health Service, will have charge of the work. The Red Cross will undertake such sanitary management only by request of the local organization in charge.

MEDICAL RESERVE CORPS.—Dr. David D. Scannell of Boston has been ordered to report to Fort Benjamin Harrison, Indianapolis, and left this city on August 7, for service with the Medical Reserve Corps.

TUBERCULOSIS AMONG SOLDIERS.—Dr. John B. Hawes of Boston, secretary to the trustees of the Massachusetts Hospital for Consumptives, is author of the following circular, entitled "Facts for Fighters," which has been sent out by the Massachusetts Anti-Tuberculosis League, to all soldiers and recruits in this Commonwealth.

"Consumption can be contracted by those who are weak, run down, or in any way in poor condition.

In private life any person may take chances with his health, if he cares to do such a foolish thing, without, necessarily, hurting others or the community at large. In time of war this is different. The soldier owes it to his country to maintain his bodily efficiency at the very highest possible point. This is the best way to avoid consumption.

When a soldier is on duty, the details of his life are regulated in every way. When he is off duty he can do himself physical harm or good. Therefore he should spend this time as profitably as possible by increasing his bodily strength and energy and not wasting it. This is an important way of preventing consumption.

Excesses of all kinds weaken a man and render him liable to infection, especially to infection with consumption.

Remember that the germs of consumption and other contagious diseases are spread by spit. Therefore never spit in closely crowded quarters, barracks, tents, etc.

Danger Signals. If you develop a cough, with or without spit, which hangs on for some time; if you raise any blood; if you are losing weight and strength, don't wait but go at once to the proper person and place these facts before him.

If you know that you have consumption, even though you have passed the physical examination, don't conceal it. The chances are that you will break down later on. You will do your country no good, but, on the contrary. you will do it great harm if you conceal this fact.

Remember that one of the greatest things you, as a soldier, can offer to your country is good health."

AMERICAN WOMEN'S HOSPITALS.—The War Service Committee of the Medical Women's National Association has organized the American Women's hospitals for work at home and abroad. The Surgeon-General of the Army, and the General-Director of the Department of Military Relief of the American Red Cross have approved the provision made for service to the army and to the civil population. The work will be officially part of the medical and surgical service of the American Red Cross.

The scope of the plan is broad. It includes units for maternity service and village practice in the devastated parts of the Allies' countries and hospitals run by women for service there as well as for the United States army in Europe. In this country acute and convalescent cases will be treated in hospitals equipped for the purpose; soldiers' dependents will be cared for, interned alien enemies will be given medical aid and substitutes will be provided to look after the hospital service and the private practice of physicians who have gone to the front. The first units hope to go to France and to Serbia in the early fall. Headquarters have been established at 637 Madison Ave., New York City. Dr. Rosalie Slaughter Morton is Chairman of the War Service Committee.

DIPHTHERIA IN NEWPORT.—On August 9 the number of new cases of diphtheria reported in Newport, R. I., was fifteen, the lowest since the outbreak of the disease. This made the total number of cases 267. The health officials, in an effort to check the epidemic, have prohibited the sale of ice cream and have refused to allow the shipment of milk or the departure of any person from nine dairy farms in Portsmouth. With but one exception those affected have a light form of the disease. At Fort Adams there are

eight cases among the Naval Reserves. A strict quarantine is maintained. Drs. George W. McCoy and Joseph Bolton of the United States Public Health Service have arrived to aid in checking the epidemic.

Physical Condition of Drafted Army.—The Bulletin of the Department of Health, New York City, makes the following comment on the physical condition of men who are examined for drafting into the army.

"According to press reports concerning the results of the physical examination of men drafted for military service, the proportion of men found physically fit is surprisingly small. This is discouraging, for, while the army standards undoubtedly demand a good physique, they do not, by any means, seek perfection. It is, of course, possible that the results of these first examinations are not fairly representative, and that the proportion of those who meet the requirements will eventually reach a satisfactory average. The results thus far, however, would seem to indicate that we are dealing here with the fruits of individual and community neglect; many of the defects disclosed at these examinations could undoubtedly have been prevented by suitable attention in early life.

It is significant that the individuals examined represent a class which did not have the benefit of the corrective influence exercised by school medical inspection. Certain it is that the health and physical condition of the coming generation has been much more carefully safeguarded. Each year nearly a third of a million school children in the city of New York are medically examined by physicians of the Department of Health. In one-third of the children various forms of physical defects are found, most of them remediable. It is by insistent follow-up of these cases by the Department's school nurses that a very large proportion of these defects are corrected. That this form of supervision is productive of good results and will, in time, result in a higher average of physical well-being in the adult population of this city, is indicated by the fact that the physical examination of pupils in the upper grades in school, or of high school pupils, regularly, shows a lower proportion of physical defects than that found in the examination of pupils of the lower grades.

The lesson taught by the results of the draft examinations is plain. We must strive in every way possible to discover and correct physical defects early in life. But this is not all. By insistence on proper living conditions, *i.e.*, good homes, good food, sanitary shop conditions, decent wages and wholesome rest and recreation, we should make sure that physical health will be maintained."

Irish Medical Profession in the War.—The *British Medical Journal* has recently published the following sketch descriptive of the contribution of service made by the Irish medical profession in the war.

"Since the outbreak of the war the Irish medical profession has voluntarily supplied a large proportion of its members for the medical services of the army and navy. The proportion of Irish doctors who have joined the medical services is much higher than would appear from a casual glance of the number of doctors who are registered with Irish addresses. Whilst over 3000 doctors are usually registered with Irish addresses, it is very doubtful whether, even in times of peace, the number engaged in all classes of Irish medical practice ever reached 2000. It is generally estimated that only one in six newly qualified Irish doctors commences practice in Ireland. The great majority go to England and Wales and a smaller number go to the colonies.

Owing to the number of doctors who have accepted temporary commissions in the R.A.M.C., there are many rural districts in Ireland depending upon one doctor to look after the health of 6000 or 8000 of the population, and it is believed that even if military service were made compulsory on the profession in Ireland, the number of doctors joining the medical services could not be very much increased beyond that now obtained voluntarily.

The members of the Irish profession who have remained at home because they are over military age, or for other reasons, have given very valuable help in treating wounded soldiers in the general hospitals, or in V.A.D. hospitals, specially organized for the reception and treatment of wounded soldiers. The War Office accepted last April a long-standing offer from the medical profession in Dublin to staff a base hospital for France. The doctors who will form the staff of this hospital will work in relays of nine for a term of three months, and will consist of three surgeons, two physicians, an ophthalmologist, a pathologist, a radiographer, and an anesthetist. Similar offers have been made by the profession in Belfast and Cork, but, so far, they have not been accepted by the War Office.

The Irish Medical War Committee was formed at a meeting of the profession convened by the Leinster Branch of the British Medical Association in May, 1915. It consists of two representatives of each of the various licensing bodies and medical schools in Ireland. Among its chief duties are: (1) to provide doctors for the army and navy, (2) to protect the interests, during their absence, of those doctors who join the medical services and to assist them in finding suitable substitutes, (3) to advise regarding the medical requirements of the civil population. Public bodies, such as boards of guardians, have, with very few exceptions, given facilities to their medical officers who desired to apply for commissions in the medical services. They have not only given them the necessary

leave, but in most cases have agreed to pay half their salaries during their absence as well as to pay the full salaries of their locumtenents. It is, however, to be regretted that some boards of guardians have persisted, contrary to the advice of the Irish Medical War Committee and the ruling of the Local Government Board, in appointing, as locumtenents, doctors of military age, when it was open to them to appoint doctors who were not available for military service.

AN AMERICAN MEDICAL PRISONER.—Report from New York on July 13 describes the adventures of Dr. A. M. Mars of San Francisco, who for nearly three years, it is said, was held prisoner in a German detention camp at Luxemburg, despite his protests that he was an American citizen, though born in Paris. Dr. Mars is reported as saying that he was well treated by the Germans, and was put in sanitary charge of the camp, where about three thousand French and English prisoners were detained. Dr. Mars finally escaped to Holland, whence he sailed to New York on a Spanish steamship.

ARRIVAL OF TUBERCULOSIS COMMISSION.—The Tuberculosis Commission, under the leadership of Dr. Livingston Farrand, sent to France by the Rockefeller Foundation, has arrived in Paris, and is in coöperation with the Red Cross representative, Homer Folks.

APPOINTMENTS OF VETERINARY SURGEONS.—Surgeon-General Gorgas of the United States Army has appointed an advisory board to reorganize the Veterinary Corps of the Army. It is comprised of the following men: Dr. C. J. Marshall, Pennsylvania; Dr. David S. White, dean of the College of Veterinary Medicine, Ohio State University, Columbus, O.; Dr. Louis A. Klein, dean of the School of Veterinary Medicine, University of Pennsylvania; Dr. V. A. Moore, dean of the New York State Veterinary College, Cornell University, Ithaca, N. Y.; and Dr. John R. Mohler, assistant chief of the Bureau of Animal Industry, Washington, D. C.

RED CROSS IN MERGER WITH SURGICAL DRESSINGS COMMITTEE.—The National Surgical Dressings Committee, which includes 25,000 members throughout the country, has merged its organization with the Red Cross and will henceforth work under that leadership. The committee will retain all its officials, and will continue its work as heretofore. More than 16,000,000 dressings have been sent to Europe through its branches since the war began. This is the first relief organization to merge with the Red Cross.

HOSPITAL UNITS FOR NERVOUS AND MENTAL DISORDERS.—Dr. Pearce Bailey of New York, chairman of the Committee on Furnishing Hospital Units for Nervous and Mental Disorders to the United States Government, a sub-committee of the National Committee for Mental Hygiene, has been invited by the Surgeon-General of the United States Army to accept a commission as major and to come to Washington as personal advisor to the Surgeon-General in all matters pertaining to psychiatry and neurology. Major Bailey is now on duty in the Surgeon-General's office. Dr. Frankwood E. Williams, associate medical director of the National Committee for Mental Hygiene, has been appointed vice-chairman of the committee and placed in charge of the work in the New York office.

AMERICAN HOSPITALS IN ARMY ZONE.—Two of the Red Cross Base hospitals first to arrive in the American army zone in France have been taken over by the United States Government. The first on the field was Base Hospital No. 18, organized at Johns Hopkins University, and the second, No. 15, was recruited from the Roosevelt Hospital, New York. The units are occupying French hospitals vacated for their use, and capable of accommodating from 1000 to 1500 patients. Large amounts of supplies were taken across by the units, but because of the scarcity of coal in France, the problem of heating the hospitals when cold weather approaches, will be a serious one. With such secrecy was the movement of the Roosevelt Hospital unit carried on from the time of its disembarkment at port to its establishment in hospital, that the headquarters of the press association, but a short distance away, was unaware of its existence for some days.

VOLUNTEER PHYSICIANS FOR EXAMINING SOLDIERS.—To accomplish the task of examining men to be drafted into the United States Army, in New York, many prominent physicians have volunteered their services. A large number of physicians will be called upon to make examinations in order that no unnecessary delay may arise.

ASSIGNMENTS OF NEW ENGLAND DOCTORS.—The following assignments of New England doctors have been made to conduct physical examinations under the new draft bill.

Lieut. George L. Pratt, Lieut. Merton H. Langwill, Maine Medical Corps, to Cambridge, to assist in physical examination of the 8th Massachusetts Infantry.

Maj. H. R. Stiles, U. S. A., retired, at Hartford; Lieut. Thomas F. Healey, New Haven, to make physical examination of National Guard of Connecticut at Niantic.

Capt. L. O. Tarleton, Massachusetts Medical Corps, Boston; Lieut. Herbert W. Taylor, Vermont Medical Corps; Maj. Charles C. Smith, Boston, to South Armory, Boston, to make physical examinations.

Capt. H. W. Stevenson, Medical Reserve Corps, Saco, Me.; Lieut. Arthur P. Perry, Bos-

ton, to Concord, N. H., for physical examination of National Guard.

Capt. A. E. Austin, Medical Reserve Corps, Boston; Lieut. Ray E. Smith, Vermont Medical Corps, to Charlestown Armory for physical examination of 5th Massachusetts Infantry.

Capt. Harry G. Martin, Massachusetts Medical Corps; Lieut. Frank Piper, Rhode Island Medical Corps, to Quonset Point, R. I., for physical examination.

Capt. Mason D. Bryant and Lieut. Arthur M. Curran, Massachusetts Medical Corps; Lieut. George H. Kirkpatrick of Framingham, to Boxford, for physical examination of National Guard there.

Capt. James Glass, Ayer, and Lieut. Clyde C. Johnson, New London, Conn., for physical examination of Coast Artillery Corps of Connecticut.

Lieut. William R. Dwyer and Lieut. James A. Lyon, Framingham, to Allston to assist in physical examinations.

Sergts. Region V. Love and Harry W. White, C. A. C., to Boxford for clerical work, in connection with muster of troops. Sergt. Steven E. Smith for clerical work at 1st Corps Cadets Armory; Sergt. Clarence G. Meyer to Commonwealth Armory, Allston, for clerical work.

Appointments on Medical Staff of State.—The State Guard of Massachusetts, consisting of 135 companies, numbering about 9000 men, has on its medical staff the following men: Medical staff—Lieut.-Col. William A. Brooks; surgeons, Capt. Donald V. Baker, Capt. William A. Brown, Capt. Harold G. Giddings, Capt. George W. Morse, Capt. Russell F. Sheldon, Capt. Benjamin E. Sibley, Capt. Edward A. Supple; physicians, Capt. John W. Dewis, Capt. Thomas F. Harrington; nose and throat surgeons, Capt. George L. Tobey, Capt. D. Harold Walker; dental surgeon, Capt. Kurt H. Thoma; roentgenologist, Capt. Ralph G. Leonard; ophthalmic surgeons, Capt. Ralph G. Loring, Capt. P. Somers Smyth; orthopedic surgeon, Capt. W. Russell MacAusland; surgeons throughout the state, Capt. Hardy Phippen of Salem, Capt. Charles E. Durant of Haverhill, Capt. Thomas B. Smith of Lowell, Capt. Ralph H. Seelye of Springfield, Capt. Lemuel F. Woodward of Worcester, Capt. P. Truesdale of Fall River, Capt. Garry DeN. Hough of New Bedford, Capt. Franklin H. Thompson of Fitchburg.

College Ambulance Corps.—There are nearly 5000 college men in the military camp at Allentown, Pa., training for work in ambulance corps abroad.

Condition of Men in Pershing's Army.—Report from the American Training Camp in France states that the health of the troops is of the best. What little sickness there is is limited almost entirely to measles and mumps contracted in the United States. Every soldier has been vaccinated against smallpox and inoculated against typhoid. Each troop section has a supply of hypochloride of calcium for purifying the water used. An adjacent French base hospital has been taken over by the American army and will be equipped with a staff of physicians from Johns Hopkins Medical School. The capacity of the hospital is for one thousand beds. Each troop section has a local dispensary with twelve beds and a field hospital.

Health Measures for Ayer Camp Ground.—The monthly Bulletin of the State Department of Health for June gives an account of the preparations made for adequate sanitary care of the military camp in Northern Massachusetts:

"The towns in which the camp is located, together with those adjoining, are Ayer, Littleton, Harvard, Lancaster, Shirley, Townsend, Groton and Pepperell, having a population, according to the 1910 census, of from 1034 to 2955, aggregating 16,534. During the next five years they gained in population but 397. These towns are as well organized for the preservation of health as the average Massachusetts town of their size. They have the usual sanitary conditions, consisting of little else than a good water supply, Harvard and Townsend being the only ones without a public supply for their thickly settled districts. None have a public sewer system, consequently most of them at times have cesspool, drainage and privy nuisances. But few have efficient milk inspectors. All have inspectors of slaughtering, but no inspectors of provisions. All have medical inspection of schools, but not of an intensive character. Ayer, Lancaster and Pepperell already have public health or district nurses, including school nursing, while Groton and Shirley have plans nearly perfected for employing similar workers.

Realizing that it would be an injustice to tax the towns for more than would be required for a first-class health organization in ordinary times, the Commissioner of Health addressed the following communication to his Excellency the Governor of the Commonwealth of Massachusetts:—

May 21, 1917.

'To His Excellency, Hon. Samuel W. McCall, Governor of the Commonwealth of Massachusetts, State House, Boston, Mass.

Sir:—I have the honor to invite attention to the very serious sanitary problem which presents itself in connection with the proposed military camp at Ayer. It is proposed to place 30,000 men for training in this camp. There will be, undoubtedly, a surplus population of 8,000 or 10,000 civilians suddenly added to the population of Ayer and the surrounding towns. Camp followers, unlicensed venders of food and drink, prostitutes and other persons disposed to disregard law and ordinances will drift into this area.

Within a radius of 10 miles from Ayer as a center there are 15 towns with populations ranging from 800 to 3,000. Manifestly, these towns are unable to finance a proper health organization, and it would be unfair to expect that of them. Experience in England and France has proved that to avoid disaster the complete sanitary organization should be in the field working long before the recruits begin training. The Federal government, under existing law, is restricting its sanitary work to the care of the soldier and his camp. A bill for a Federal sanitary reserve corps, which would take care of the surroundings of camps and the civilian population contiguous thereto, is in Congress now, and has the unanimous support of the National Council of Defense. This may or may not go through, but even if it does it will operate too late to meet the emergency which we now face in Massachusetts.

To avoid disastrous conditions prompt action is necessary, and the sanitary organization should be placed in the field with the minimum of delay. There is no money available for such an extraordinary purpose in addition to the ordinary duties of the State Health Department. The work would require the full time of one District Health Officer, one assistant sanitary engineer, two sanitary inspectors, one food and drug inspector, three public health visiting nurses, and the staff and expenses of a small contagious disease hospital. A careful estimate of the cost of such an organization has been made, and $20,000 will be necessary for the period of one year.

In view of the fact that in the last analysis this is a Federal matter, an emergency obligation placed upon Massachusetts by Federal action, it seems reasonable that the Federal government would later take over the financing of such work and reimburse States for expenditures made. It would be a fatal blunder, however, to wait for Federal action to meet this menace and cover this emergency.

I have the honor, therefore, to recommend that the sum of $20,000, or such part thereof as may be necessary, be appropriated to be expended under the direction of the Commissioner of Health for the purpose of protecting the health of the people of Massachusetts and establishing and maintaining sanitary conditions in the area within a 15-mile radius of Ayer.

Respectfully,

A. J. McLAUGHLIN,
Commissioner of Health.' "

Upon receiving the communication the Governor submitted to the Legislature a message incorporating the recommendation of Dr. McLaughlin and asking for an appropriation of $20,000 to furnish means of a complete sanitary organization and of $10,000 to establish a supplementary police force to cope with moral evils engendered by the presence of a military camp and to secure due enforcement of existing law.

In response to this message, the following special act was passed by the Legislature.

"The State Department of Health was asked by the town officials to direct the public health work in the various towns. The Commissioner appointed the following committee to represent the Department in the field: Dr. Charles E. Simpson of Lowell, chairman, Dr. William W. Walcott of Natick, and Dr. Francis A. Finnegan of Fitchburg, recorder.

An organization has been formed comprising an executive member of the board of health of the various towns as a community health council to act in conjunction with, and under the discretion of the State District Health Officers. In this way a uniformity of rules and regulations and in the manner of their enforcement throughout these towns will be secured. A similar organization of selectmen and school boards is under way, and it is hoped to interest the various public safety committees along similar lines.

It is proposed to establish in Ayer headquarters for the State officers who are to help in carrying out this work, and to furnish an inspector of milk, food and provisions from the State Health Department. A sanitary inspector or inspectors will also be provided, and a supervising nurse and other nurses, if necessary. Some provision is under consideration for an isolation hospital."

HOMEOPATHIC BASE HOSPITAL.—The American Institute of Homeopathy has offered to the Government, through the Red Cross, three base hospitals with one thousand trained men, equipped for war purposes. These base hospitals would be connected respectively with the Metropolitan and the Hahnemann Hospitals of New York and the Hahnemann Hospital of Chicago.

WAR RELIEF FUNDS.—On Aug. 17, the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$246,648.87
Armenian Fund.....	215,240.13
Permanent Blind Fund.....	121,732.73
Surgical Dressings Fund.....	116,961.01
Polish Fund.....	77,415.95
Italian Fund.....	44,114.72
War Dogs' Fund.....	1,003.75

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending Aug. 11, 1917, the number of deaths reported was 205, against 220 last year, with a rate of 13.86 against 1509 last year. There were 42 deaths under one year of age, against 49 last year.

The number of cases of principal reportable diseases were: Diphtheria, 49; scarlet fever, 7;

measles, 40; whooping cough, 33; typhoid fever, 3; tuberculosis, 69. Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever, 1; whooping cough, 1; tuberculosis, 3.

Total deaths from these diseases were: Diphtheria, 4; measles, 4; whooping cough, 1; typhoid fever, 2; tuberculosis, 17. Included in the above were the following non-residents: Diphtheria, 2; tuberculosis, 2.

Dedication of Ipswich Hospital.—The new building of the Benjamin Stickney Cable Hospital at Ipswich, Mass., was dedicated on August 4, with appropriate exercises. This hospital is the gift of Richard T. Crane, Jr., and Mrs. Crane to the town of Ipswich. It has an endowment of $30,000. It accommodates twenty-four patients, and to those who cannot pay its services are free. Mrs. Helen S. Chapman, a graduate of the Massachusetts General Hospital Training School, is superintendent, and local doctors will be on the active staff. The trustees have offered the hospital to the government as a base hospital if need arises, and the building then can be made to accommodate one hundred and fifty beds. Herbert Warren Mason is president of the board of trustees, Rev. T. Franklin Waters, secretary, and Howard N. Doughty, treasurer. Physicians on the active staff are: Dr. G. G. Bailey, Dr. Frank L. Collins, Dr. George E. MacArthur and Dr. M. C. McGinley. On the general consulting staff the following have agreed to serve: surgical, Dr. J. Dellinger Barney, Dr. Fred B. Lund, Dr. Charles G. Mixter, Dr. William J. Mixter, Dr. Samuel J. Mixter; medical, Dr. Charles W. Townsend, Dr. William B. Robbins, Dr. William E. Tucker, Dr. H. F. Vickery; children, Dr. Richard M. Smith, Dr. Maynard Ladd; ear and throat, Dr. Eugene A. Crockett, Dr. George H. Powers, Jr.; nose and throat, Dr. J. L. Goodale; neurologist, Dr. E. W. Taylor; skin, Dr. E. L. Oliver; obstetrics, Dr. Howard T. Swain, Dr. James L. Huntington; oculist, Dr. Alex Quackenboss; orthopedic, Dr. Robert B. Osgood, Dr. Lloyd T. Brown; dental staff, Dr. F. W. Keyes, Dr. E. J. Smith, Dr. F. A. Stockwell.

The hospital is given in memory of Benjamin Stickney Cable, a friend of Mr. Crane, who was fatally injured in an automobile accident near Ipswich a few years ago.

Infantile Paralysis in Massachusetts.—There have been ten cases of infantile paralysis reported to the State Department of Health for the month of July. At a corresponding date last year twenty-nine cases had been reported. The cases reported for the first sixteen days of the month are as follows: Haverhill, 4; Lowell, 2; and Medford, Beverly, Springfield and Malden, each 1.

Tuberculosis Conference at Framingham.—The Framingham Health and Tuberculosis Demonstration held, on July 23, at Framingham, a quarterly meeting of its national committee. There were present Dr. Charles L. Miner of Asheville, N. C., president of the National Tuberculosis Association, Dr. Charles J. Hatfield of Philadelphia, Dr. Leo K. Frankel of New York, and Dr. Eugene H. Kelley and Dr. Arthur K. Stone of Boston. The committee plans to hold meetings at least semi-annually in Framingham during the three-year period of the health demonstration. Other meetings are ordinarily held in New York. Special satisfaction was expressed at the amicable and helpful relations existing between the Health Station and local authorities.

Brockton Hospital.—Report of Brockton Hospital, Brockton, Mass., for the year 1916 shows a substantial increase in the number of patients treated. There were 1244 patients admitted to the wards, an increase of 7%, and 690 out-patients treated, or an increase of 56%. The orthopedic service increased in number of patients by 25%, and the obstetric service by 70%. The per capita cost remains unchanged, at $13.95 per week. Of the 1503 weeks of treatment furnished, 723 patients paid in full, 112 patients paid in part, and 456 patients paid nothing. It is desired that a new ward building be added to the hospital, in order to cope with its increasing demand for service.

Faulkner Hospital.—The Faulkner Hospital of Jamaica Plain, Mass., held, on August 8, the graduating exercises of the nurses' training school and celebrated the opening of the new maternity building. Seven nurses received their diplomas.

Boston School of Physical Education.—The fourth annual catalogue of the Boston School of Physical Education calls attention to the new building soon to be occupied by the school, on South Huntington Avenue, Boston. This institution, established as is stated "to provide for women a course in physical education which should fit them to meet as teachers the increasing need for instruction in the proper use of the body and its relation to human efficiency," offers a course of study covering two years of thirty-two weeks each. Carefully directed training is given in posture, gymnastics, games, dancing and swimming. With this is correlated systematic instruction in such allied academic subjects as anatomy, physiology, hygiene, and the principles of education.

Poliomyelitis in Brockton, Mass.—The appearance of three cases of poliomyelitis in Brockton, Mass., in two weeks, while causing some local anxiety, shows how little the occurrence of another epidemic is to be feared this present season.

The Massachusetts Medical Society.

AN ACT RELATIVE TO THE SALE AND DISTRIBUTION OF CERTAIN NARCOTIC DRUGS.

Be it enacted, etc., as follows:

SECTION 1. Except as otherwise provided in sections two and three hereof it shall be unlawful for any person, firm or corporation to sell, furnish, give away or deliver coca leaves or any cocaine or any alpha or beta eucaine or any synthetic substitute therefor, or any salts, compound or derivative thereof, except decocainized coca leaves and preparations thereof, or any opium, morphine, heroin, codeine or any preparation thereof, or any salt, compound or derivative of the same, except upon the written order of a manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business, as such, physician, dentist, veterinarian, registered under the laws of the state in which he resides, or an incorporated hospital, college or scientific institution through its superintendent or official in immediate charge, or upon the written prescription of a physician, dentist or veterinarian, registered under the laws of the state in which he resides, bearing his legal signature, the date of the signature, his office address, the registry number given him under public acts two hundred and twenty-three of the sixty-third congress, approved December seventeenth, nineteen hundred and fourteen, and the name, age and address of the patient for whom it is prescribed. The prescription, when filled, shall show the date of filling and the legal signature of the person filling it written across the face of the prescription, together with the legal signature of the person receiving any such drug, and the prescription shall be retained on file by the druggist filling it for a period of at least two years. No prescription shall be filled except in the manner indicated therein, and at the time when it is received, and the full quantity of each substance prescribed shall be given. No order or prescription shall be received for filling or filled more than five days after its date of issue as indicated thereon. Any pharmacist who fills a prescription for a narcotic drug shall securely attach to the container thereof a label giving the name and address of the store in which the prescription is filled, the date of filling, the name of the person for whom it is prescribed, the name of the physician, dentist, or veterinarian who issued it; and the narcotic drug so delivered shall always be kept in its container until actually used. The prescription shall not again be filled, nor shall a copy of the same be made, except for the purpose of record by the druggist filling the same, and it shall at all times be open to inspection by the officers of the state department of health, the board of registration in pharmacy, the board of registration in medicine and the authorized agents of said departments and boards, and by the police authorities and police officers of cities and towns: *provided, however*, that the provisions of this act shall not apply to prescriptions, nor to the sale, distribution, giving away or dispensing or possession, of preparations or remedies, if such prescriptions, preparations and remedies do not contain more than two grains of opium or more than one quarter of a grain of morphine, or more than one eighth of a grain of heroin or more than one grain of codeine, or any salt, compound or derivative of any of them in one fluid ounce, or, if a solid or semi-solid preparation, in the avoirdupois ounce; nor to liniments, ointments or other preparations which are prepared for external use only, except liniments, ointments and other preparations which contain cocaine or any of its salts or alpha or beta eucaine or any of their salts or derivatives, or any synthetic substitute for them; *provided*, that such preparations, remedies or prescriptions are sold, distributed, given away or dispensed or held in possession in good faith as medicines and not for the purpose of evading the provisions of this act, and *provided, further*, that the possession of any of the drugs mentioned in this act, except prescriptions and preparations or remedies especially exempted in this section, by any one not being a manufacturer or jobber of drugs, or wholesale druggist, registered pharmacist, actively engaged in business as such, or a physician, dentist or veterinarian, registered under the laws of the state in which he resides, or superintendent or official in charge of an incorporated hospital, college or scientific institution shall, except as provided in section eight, be presumptive evidence of an intent to violate the provisions of this act. The provisions of this section shall not apply to persons having in their possession any of the above mentioned articles by virtue of a legal prescription legally issued as provided in this act, and not obtained by any false representation made to the physician, dentist or veterinarian issuing it, or to the pharmacist who filled it, nor shall the provisions of this act apply to decocainized coca leaves or preparations made therefrom or to other preparations of coca leaves which do not contain cocaine.

SECTION 2. It shall be unlawful for any practitioner of veterinary medicine or surgery to prescribe any of the drugs mentioned in section one of this act for the use of, or in such manner that it may be used subcutaneously by a human being, and it shall be unlawful for any physician or dentist to prescribe, dispense, administer, sell, give away, or deliver, any narcotic drug to any person except when the drug is obviously and in good faith then and there needed for the treatment and cure of a disease or ailment, and not for any condition or disease directly due to any drug habit or resulting solely from the failure of an habitual user of narcotic drugs to procure the particular narcotic drug or drugs to which he is addicted.

SECTION 3. It shall not be unlawful for a physician personally to administer any narcotic drug at such time and under such circumstances as he, in good faith and in the legitimate practice of medicine, believes to be necessary for the alleviation of pain and suffering or for the treatment or alleviation of disease.

SECTION 4. Any manufacturer or jobber of drugs, any wholesale druggist, any registered pharmacist actively engaged in business as such, and any physician, dentist or veterinarian registered under the laws of the state in which he resides may sell coca leaves, cocaine or any alpha or beta eucaine or any synthetic substitute for them or any preparation containing the same, or any salts, compound or derivative thereof, or any opium, morphine, codeine, heroin or any preparation thereof, or any salt or compound or derivative of such substances, to any manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business as such, or physician, dentist or veterinarian registered under the laws of the state in which he resides, or to any incorporated hospital, college or scientific institution, but such substances or preparations, excepting such preparations as are included within the exemptions set forth in section one, shall be sold only upon the written order of an incorporated hospital, college or scientific institution, duly signed by its superintendent or official in immediate charge, or upon a written order duly signed by such manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business as such, or physician, dentist or veterinarian registered under the laws of the state in which he resides, and the order shall state the article or articles ordered, the quantity ordered and the date. The said orders shall be kept on file in the laboratory, warehouse, pharmacy or store in which they are filled by the proprietor thereof or his successors for a period of not less than two

years after the date of delivery, and shall be at all times open to inspection by the state department of health, the board of registration in pharmacy, the board of registration in medicine and the authorized agents of said department and boards, and by the police authorities and police officers of cities and towns.

SECTION 5. Any manufacturer or jobber in drugs and any wholesale druggist, any registered pharmacist actively engaged in business as such, any physician, dentist or veterinarian registered under the laws of the state in which he resides, and any incorporated hospital, college or scientific institution through its superintendent or official in immediate charge that shall give an order for any of the aforesaid drugs in accordance herewith shall preserve a duplicate thereof for a period of two years after the date of giving the same, which shall at all times be open to inspection by the state department of health, members of the board of registration in pharmacy, the board of registration in medicine and the authorized agents of said department and boards, and by the police authorities and police officers of cities and towns. The order now or hereafter required by the regulations of the commissioner of internal revenue under and by virtue of said public act number two hundred and twenty-three of the sixty-third congress, shall be deemed to be a sufficient order to comply with this and the preceding section.

SECTION 6. Any person who, for the purpose of evading or assisting in the evasion of any provision of this act shall falsely represent that he is a physician, dentist or veterinarian, or that he is a manufacturer or jobber in drugs or wholesale druggist or pharmacist actively engaged in business as such, or that he is superintendent or official in immediate charge of an incorporated hospital, college or scientific institution, or a person registered under said public act two hundred and twenty-three of the sixty-third congress, or who, not being an authorized physician, dentist or veterinarian, makes or alters a prescription or written order for any of the narcotic drugs above mentioned, or knowingly issues or utters a prescription or written order falsely made or altered, or whoever makes any false representation or statement as to his name, age, address, or any other matter, either in writing or orally, to any physician, dentist, pharmacist, or veterinarian for the purpose of procuring a prescription for, or the delivery of, a narcotic drug, shall be deemed guilty of a violation of this act. A prescription or order that is altered, or is obtained by a false representation shall be void and of no effect.

SECTION 7. The possession of a federal certificate issued under and by virtue of said public act number two hundred and twenty-three of the sixty-third congress, by any person shall be prima facie evidence of an intent to sell, furnish, give away or deliver any of the drugs mentioned in this act.

SECTION 8. Nothing in this act shall apply to common carriers engaged in transporting the aforesaid drugs or to any employee, acting within the scope of his employment, of any person who shall lawfully be in possession, for the purpose of delivery, of any of the drugs mentioned in this act, or to any person who shall deliver any such drug, which has been prescribed or dispensed by a physician, dentist or veterinarian registered under the laws of the state in which he resides, who has been employed to prescribe for the particular patient receiving such drug, or to a nurse under the supervision of a physician, dentist or veterinarian having possession or control by virtue of his employment or occupation and not on his own account, or to the possession of any of the aforesaid drugs which have been prescribed in good faith by a physician, dentist, or veterinarian or to any United States, state, county, municipal, district, territorial or insular officer or official who has possession of any of said drugs by reason of his official duties, or who, as an officer or duly appointed agent of any incorporated society for the suppression of vice, has the same in his possession for the purpose of assisting in the prosecution of violations of this act.

SECTION 9. The provisions of this act, except those sections which require the ordering of the above mentioned drugs on an official order blank and the keeping of the same on file, and the keeping of the record relative thereto, shall apply to cannabis indica and cannabis sativa, except that the same shall not apply to prescriptions, preparations or remedies which do not contain more than one half grain of extract of cannabis indica or more than one half grain of extract of cannabis sativa in one fluid ounce, or, if a solid or semi-solid preparation in the avoirdupois ounce, nor to liniments, ointments or other preparations containing cannabis indica and cannabis sativa, which are prepared for external use only.

SECTION 10. A manufacturer or jobber in drugs or wholesale druggist or registered pharmacist shall not be liable to prosecution if he fills any prescription or written order for a narcotic drug in good faith, unless he knows or has reasonable cause to suspect that the prescription or order was issued in violation of the provisions of this act, in which event any sale or delivery of a narcotic drug so made shall constitute an unlawful sale and delivery of a narcotic drug under this act.

SECTION 11. No physician, dentist, or veterinarian, and no druggist or pharmacist, either wholesale or retail, shall solicit by public advertisement or otherwise application to him for prescriptions for, or sales of, narcotic drugs, or shall publicly advertise any treatment the principal element of which consists in the administering, dispensing, furnishing, giving away or delivering of a narcotic drug, except, however, that wholesale druggists or manufacturing pharmacists may advertise in journals and publications intended for circulation among the medical profession and drug trade generally.

SECTION 12. All buildings, places or tenements which are resorted to by habitual users of narcotic drugs for the purpose of using such drugs, or which are used for the illegal keeping or sale of the same, shall be deemed common nuisances. Whoever keeps or maintains such a common nuisance shall be punished by a fine of not more than one hundred dollars, or by imprisonment for not more than one year.

SECTION 13. Whoever, not being a manufacturer or jobber of drugs, wholesale druggist, registered pharmacist, registered physician, registered veterinarian, registered dentist, nurse, acting under the direction of a physician, or an employee of an incorporated hospital acting under the direction of its superintendent or official in immediate charge, or a common carrier or messenger when transporting any drug mentioned herein between parties hereinbefore mentioned in the same package in which the drug was delivered to him for transportation, is found in possession thereof, except by reason of a physician's prescription lawfully and properly issued shall be punished by a fine of not more than one thousand dollars or by imprisonment for not more than three years in the house of correction.

SECTION 14. Whoever shall have in his possession a narcotic drug with intent unlawfully to sell and deliver such drug, or any part thereof, or whoever unlawfully sells, furnishes, gives away or delivers any narcotic drug in violation of the provisions of this act, shall be punished by imprisonment in the state prison for not more than three years, or in a jail or house of correction for not more than two years, or by a fine not exceeding two thousand dollars.

SECTION 15. It shall be unlawful for any person, not being a physician, dentist or a veterinarian, registered under the laws of this state or under the laws of the state in which he resides, wholesale

druggist, manufacturing pharmacist, registered pharmacist, manufacturer of surgical instruments or any official of any government, having possession thereof by reason of his official duties, or a nurse, acting under the direction of a physician, or the employee of an incorporated hospital, acting under the directions of its superintendent or officer in immediate charge, or a carrier or messenger engaged in the transportation thereof, to have in his possession a hypodermic syringe, a hypodermic needle, or any instrument adapted for the use of narcotic drugs by subcutaneous injection. No such syringe, needle, or instrument shall be delivered or sold except to a registered pharmacist, physician, dentist, veterinarian, wholesale druggist, manufacturing pharmacist, a nurse upon the written order of a physician, or to an employee of an incorporated hospital upon the written order of its superintendent or officer in immediate charge. A record shall be kept by the person selling such instruments which shall give the date of the sale, the name and address of the person purchasing the same, and a description of the instrument. This record shall at all times be open to inspection by the state department of health, the board of registration in medicine, dentistry, veterinary medicine, and pharmacy, by the authorized agents of said department and boards, and by the police authorities and police officers of cities and towns. Any violation of this section shall be punishable by a fine of not more than one hundred dollars, or by imprisonment in the jail or house of correction for not more than six months, or by both such fine or imprisonment.

SECTION 16. In a prosecution under this act for unlawfully prescribing, selling, furnishing, giving way, or delivering a narcotic drug in violation of any provision of this act, it shall be sufficient to allege that the defendant did unlawfully prescribe, sell, furnish, give away, or deliver, as the case may be, the alleged narcotic drug, without any further allegations, and without expressly negativing the different exceptions of the act, and without naming the person for whom said prescription was issued, or the amount or quantitiy of the drug, or the person to whom such sale, furnishing, giving away or delivery was made; but the defendant shall be entitled to a bill of particulars under the provisions of section thirty-nine of chapter two hundred and eighteen of the Revised Laws.

SECTION 17. The defendant in a prosecution under this act who relies for his defence and justification upon a prescription, written order, registration, appointment, or authority as an excuse under this act, shall prove the same; and, until he has proved it, the presumption shall be that he is not so justified or authorized.

SECTION 18. The forms hereto annexed shall apply as well to complaints as to indictments, and such forms shall be sufficient in cases to which they are applicable. In other cases, forms as nearly like the forms hereto annexed as the nature of the case and the provisions of law will allow may be used; but any other form of indictment or complaint which is authorized by law may be used.

FORMS AND SCHEDULES OF PLEADING.

Common Nuisance.—That A. B., during the three months next before the finding of this indictment, at said [Boston], did keep and maintain a certain tenement resorted to by habitual users of narcotic drugs for the purpose of using narcotic drugs.

Unlawful Possession.—That A. B. did have in his possession, unlawfully, certain narcotic drugs, to wit, morphine (cocaine, heroin, or the name of drug as it is commonly known).

Unlawful Possession with Intent to Sell.—That A. B. did have in his possession with intent unlawfully to sell and deliver a certain narcotic drug (naming the drug).

Conspiracy.—That A. B. and C. D. conspired together to engage in unlawful traffic in narcotic drugs.

Sale and Delivery.—That A. B. did unlawfully sell (or give away, or deliver) a narcotic drug, to wit, morphine (or name drug is commonly known by).

Unlawful Prescribing and Delivery, etc., by Physicians, etc.—That A. B., a physician, (or pharmacist, dentist or veterinarian, etc.) did unlawfully prescribe (or sell, give away, furnish or deliver) a certain narcotic drug, to wit, (naming it).

Possession of Hypodermic Instrument.—That A. B. did have in his possession, unlawfully, a hypodermic syringe and needle.

Sale and Delivery of Hypodermic Instrument.—That A. B. did unlawfully sell (or deliver) a hypodermic syringe (or needle).

False Making Prescription.—That A. B. did falsely make (or alter) a prescription for a narcotic drug.

Uttering a False Prescription.—That A. B. did utter and publish as true a certain false prescription for a narcotic drug, well knowing the same to be falsely made (or altered).

Misrepresentation.—That A. B. did falsely represent to C. D. (a physician, dentist, veterinarian, pharmacist, etc.) for the purpose of obtaining a narcotic drug that (state the substance of the statements claimed to be representations).

DEFINITIONS.

SECTION 19. Terms used in this chapter shall be construed as follows, unless a different meaning is clearly apparent from the language or context, or unless such construction is consistent with the manifest intention of the legislature:—

"Narcotic drug" shall mean cannabis indica, coca leaves, or any cocaine, or any alpha, or beta, eucaine, or any synthetic substitute for them, or any salts, compound or derivative thereof, except decocainized coca leaves and preparations thereof, or any opium, morphine, heroin, codeine, or any preparation thereof, or any salt, compound or derivative of the same.

"Physician," "practitioner of medicine", "veterinarian", "veterinary surgeon", "dentist", shall mean persons duly registered and authorized to practice medicine, veterinary medicine, surgery, and dentistry.

"Druggist," "apothecary," or "pharmacist" shall mean a person duly registered under chapter seventy-six of the Revised Laws, and actively engaged as a practitioner, or employee, in an established and fixed place of business for the sale, compounding and dispensing of drugs.

"Persons" as used herein shall include all corporations, associations, partnerships, or other aggregations of individuals, including also their agents, clerks and salesmen.

"Opium", "morphine", heroin", "codeine" and "cocaine" as used in statutes or in complaints or indictments shall include any synthetic substitute for such drugs, or any salts, compounds, derivations, or preparations thereof, except decocainized coca leaves and preparations thereof.

SECTION 20. The repeal of any law by this act shall not affect any action, suit or prosecution pending at the time of the repeal for an offense committed, or for the recovery of a penalty, or forfeiture incurred, under any of the laws repealed.

SECTION 21. Any violation of the provisions of this act, the punishment for which is not specified herein, shall be punished by a fine of not more than one thousand dollars, or by imprisonment in a house of correction or jail for a term not exceeding one year, or by both such fine and imprisonment.

SECTION 22. Section three of chapter three hundred and seventy-two of the acts of the year nineteen hundred and eleven, as amended by section two of chapter two hundred and eighty-three of the acts of the year nineteen hundred and twelve, and chapter one hundred and eighty-seven of the General Acts of the year nineteen hundred and fifteen are hereby repealed. [*Approved May 28, 1917.*]

Harvard Medical School.

REPORT OF HARVARD INFANTILE PARALYSIS COMMISSION.

The Harvard Infantile Paralysis Commission, in coöperation with the Massachusetts State Department of Health, has been engaged since November of last year in providing proper after-care treatment for the children left crippled by infantile paralysis.

Clinics have been held for the children in and about Boston at the Children's Hospital and at the Massachusetts General Hospital. In addition clinics have been held throughout the State at the following places: Newburyport, Springfield, Quincy, Lynn, Beverly, Greenfield, Worcester, Malden, Melrose, Lawrence, North Adams, and Lowell.

While it was the original purpose of the Commission to confine itself to the treatment of the persons paralyzed in 1916, only, it was soon found necessary to care for those deformed by the disease prior to 1916. In all, 1114 individuals have been treated.

In 1916 there were reported to the State Department of Health 1917 cases of the disease. Of this number, 454 died. No paralysis resulted in 246 cases, and 303 were privately treated. There remained, therefore, 914 persons to be cared for by the Commission. The Commission has supplied treatment to 698 of this number, and its field agents have visited 142 more. Therefore, only 74 persons in the State have not been reached to date.

All the treatment and advice have been given free of charge, as well as much apparatus. Transportation has been supplied in many instances by volunteer automobile drivers. The work of the Commission will be maintained as long as the public contributions support the work and the children require treatment.

Obituary.

THOMAS DYSON WALKER, M.D.

Thomas Dyson Walker, M.D., a leading physician of St. John, N. B., and known to many friends in Boston, Mass., died on July 29, at the Massachusetts General Hospital, where he had gone the previous week for treatment. Dr. Walker was born in 1867, the son of Dr. Thomas Walker of St. John, N. B. In 1891 he graduated from Edinburgh University,—a leader in his class. After working in clinics in American and Canadian hospitals, he settled in practice in his native city in 1892. For many years he was a member of the staff of the General Public Hospital and held office in the New Brunswick Medical Association. He was much interested in the organization of the 8th Field Ambulance Corps in St. John and attained the rank of Lieutenant-Colonel in the Corps. Much to his disappointment, ill-health prevented his accompanying the Corps to foreign service. He was much beloved and esteemed by his many patients and friends, not only in St. John, but wherever he was known. He is survived by his parents, three sisters and three brothers, one of whom is Dr. William Dacre Walker of Andover, Mass.

Miscellany.

HAY-FEVER PREVENTION.

In a recent issue of the *Boston Transcript* a report is made of the efforts of the Public Health Service in controlling and preventing hay-fever.

"With one hay-fever season come and gone and another coming, the United States Public Health Service emphasizes the importance of educating the public in the noxiousness of the weeds which cause this most uncomfortable of diseases. When this has been done, it is pointed out, suitable legislation will be enacted. States enact stringent laws for the exclusion of parasites injurious to their agricultural interests, and hay-fever sufferers have the right to claim that they are entitled to equal consideration. In the eastern and southern parts of the United States, two distinct seasons of hay-fever make their appearance. The average dates are from May to July for the early form and from August to October for the autumnal form. The early form of hay-fever in this part of the country is due chiefly to the pollen of the Gramineæ, which includes the grasses, both wild and cultivated, and some of the cereals, such as rye, oats and wheat. Most hay-fever weeds are wind-pollinated, and for this reason corn, although it is a hay-fever producer in theory, is not reckoned practically among the miscreants. While one might acquire hay-fever in a corn field if he went after it, the size of its pollen is relatively so great (80 microns) that it causes few cases of hay-fever, and then only in close proximity to such crops. Rye and wheat also have large, heavy pollen grains (50 microns), which gives them a limited potential area of distribution by the wind. When it is considered that the pollen of the common ragweed weighs only 15 microns, the relative harmlessness of the cereals named is apparent.

The scientists estimate that eighty-five per cent. of the hay-fever cases are caused by the common and giant ragweeds. The disease can be produced in the laboratory from insect-pollinated and self-pollinated plants, but as their pollen is not found in the air and cannot, therefore, reach the nasal passages in ordinary respiration, they are not responisble for hay-fever. Wind-pollinated plants are characterized by in-

conspicuous flowers, which are without bright colors or scent, and by the large quantity of pollen which they generate. Many wind-pollinated plants, however, have pollen which does not produce hay-fever, like the pines, sedges, etc., or which cause reactions of a mild character, like the amaranths and docks. The trees, which are largely wind-pollinated and frequently distribute their pollen in enormous quantity, usually bloom in the spring, but rarely are responsible for hay-fever. The pines scatter their pollen about as freely as snow, but appear innocent of causing harm to the human race. The pollen of some of the oaks, willows, ailanthus and other trees give a mild reaction for hay-fever, but not enough to warrant taking them into account.

A study is now being made of hay-fever in the Western part of the country, but is embarrassed by lack of information among the health authorities of the Pacific and Rocky Mountain States as to the exciting causes of this disease. Hay-fever is found to be common throughout the Rocky Mountain and Pacific States, but the common ragweed, which is responsible for so much suffering in the East, is not generally found west of Kansas. But ragweed of the same family grows throughout the Far West, and along with the Western and burweed marsh elders, the sand bur, false ragweed and the cockleburs, so brings up the average of infection that the West has no need to be jealous of the East on the score of hay-fever.

Dr. William Scheppegrell, who has been studying hay-fever for ten months, kindly remarks that while describing the plants which are responsible for the disease, it is also opportune to say a few words regarding the rose and goldenrod. The rose is insect-pollinated and could, therefore, cause hay-fever only by direct inhalation, as the pollen is never found in the atmosphere. In addition to this, its reaction is practically negative, so that, in spite of the common term applied to the early hay-fever,—'rose cold,'—it is not responsible for hay-fever. The goldenrod has a spiculated pollen (20 by 22 microns), which gives a positive hay-fever reaction. The flowers, however, are insect-pollinated, and cause hay-fever only on direct inhalation or when used for ornamental purposes, as in room decorations. In most sections the goldenrod continues to bloom many weeks after the hay-fever season is over. In the atmospheric-pollen plates exposed in New Orleans during the whole of the last hay-fever season, the pollen of the goldenrod was never found. In spite of its bad reputation, therefore, the goldenrod is an insignificant factor in hay-fever.

Yellow fever has been eradicated from former plague spots and bids fair in time to disappear from the face of the earth, through the practical application of well-known scientific treatment. Typhoid epidemics are traced to their source and the cause removed, never to return again if people follow the instructions of the health authorities. Tuberculosis is controlled and cured, and some day will be unknown. The time should not be far distant when hay-fever should be as rare a disease, in the great cities and towns at least, as leprosy."

PUBLIC HEALTH NURSES IN WAR.

THE following resolutions were recently adopted by the Advisory Board of the Boston Instructive District Nursing Association:

Whereas, The establishing of training camps all over the country may seriously affect the public health of surrounding communities; and

Whereas, By her special training, the public health nurse is fitted to cope with problems concerning the public health, and is the only available agent for the practical health teaching so essential in homes threatened by tuberculosis and other communicable diseases, such as venereal disease, scarlet fever, cerebrospinal meningitis, especially likely to be brought into communities near the concentration camps, and for the teaching in the care of themselves and their children prospective mothers who are being put into industrial positions, and is also peculiarly valuable in the home, teaching of food values, buying, and preparation of food, and are further and more than ever required in their capacity of social workers under these abnormal social conditions;

Whereas, Of the seventy thousand registered nurses in the country, only six thousand are public health nurses, be it

Resolved, That while there are other nurses available for Red Cross work, the Instructive District Nursing Association of Boston and the Baby Hygiene Association of Boston urges all public health nurses, for the present, to remain at their posts, and that it emphasizes the fact to the general public that by so remaining, the public health nurse is helping to conserve the most precious of our national resources, human life, and is serving her country no less truly than the nurse who goes to the front.

Endorsed by:

MASSACHUSETTS COMMITTEE ON PUBLIC SAFETY,
MASSACHUSETTS HEALTH COMMISSION
(Dr. Allan J. McLaughlin),
MASSACHUSETTS COMMITTEE OF DIRECTORS OF VISITING NURSING ASSOCIATION.